

## **Technical Construction File (TCF)**

**File No.      JWELL-230323**

According to  
Machinery Directive (2006/42/EC)

Related to the  
Plastic Sheet&Plate&Film Extrusion Line

Model: JWZN25, JWZN30, JWZN35, JWZN45, JWZN50, JWZN55, JWZN60, JWZN65,  
JWZN70, JWZN75, JWZN80, JWZN90, JWZN100, JWZN105, JWZN120, JWZN130,  
JWZN150, JWZN160, JWZN170, JWZN180, JWZN200, JWZN220, JWZN250, JWZN300,  
JWZN350, JWZN400, JWZN450, JWZN500, JWZS45, JWZS55, JWZS65, JWZS72, JWZS80,  
JWZS92, JWZS95, JWZS98, JWZS110, JWZS115, JWZTP75, JWZTP90, JWZTP93, JWZTP107,  
JWZTP120, JWZTP130, JWZTP135, JWZP25, JWZP35, JWZP52, JWZP75, JWZP85, JWZP95,  
JWZP110, JWZP120, JWZP135

Presented by

Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd.

West Of the Intersecuon Of Tongling Road And Hangzhou Road, Chuzhou City, Anhui Province,

P.R China.

<b>Technical File No:</b>	<b>Issue Date:</b>	<b>Prepared by:</b>	<b>Approved by:</b>
<b>JWELL-230323</b>	<b>March 29, 2023</b>	<b>Alex</b>	

## Sign certificate acknowledgement

Name and address of the Manufacturer 工厂的名称和地址	Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd. West Ofthe Intersecuon Of Tongling Road And Hangzhou Road,Chuzhou City,Anhui Province, P.R China.
Name and address of the Applicant (If it is necessary) 申请商名称和地址（如果需要的话）	Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd. West Ofthe Intersecuon Of Tongling Road And Hangzhou Road,Chuzhou City,Anhui Province, P.R China.
Product Name 产品名称	Plastic Sheet&Plate&Film Extrusion Line
Trademark (If necessary) 商标（如果需要）	
Models (put it as annex if necessary) 型号（如果必要可以做个附件）	JWZN25, JWZN30, JWZN35, JWZN45, JWZN50,JWZN55,JWZN60, JWZN65, JWZN70, JWZN75, JWZN80, JWZN90, JWZN100, JWZN105, JWZN120, JWZN130, JWZN150, JWZN160, JWZN170, JWZN180, JWZN200, JWZN220, JWZN250, JWZN300, JWZN350, JWZN400, JWZN450, JWZN500, JWZS45, JWZS55, JWZS65, JWZS72, JWZS80, JWZS92, JWZS95, JWZS98, JWZS110, JWZS115, JWZTP75, JWZTP90, JWZTP93, JWZTP107, JWZTP120, JWZTP130, JWZTP135, JWZP25, JWZP35, JWZP52, JWZP75, JWZP85, JWZP95, JWZP110, JWZP120, JWZP135
Directive and standard 申请的指令和标准	M D : EN ISO 12100 : 2010; EN 60204-1:2018
REMARK 其它需要说明信息	NO

**NOTE: We will issue the certificate referring the above information, please pay attention the necessary information must be correct and accurate.**

注意：我们将参考以上的基本信息签发证书， 请注意以上的信息必须是正确和准确的。

签字： \_\_\_\_\_ 盖章： \_\_\_\_\_

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## **General information**

## General information

<b>Applicant</b>	Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd. West Ofthe Intersecuon Of Tongling Road And Hangzhou Road,Chuzhou City,Anhui Province, P.R China.
<b>Manufacturer</b>	Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd. West Ofthe Intersecuon Of Tongling Road And Hangzhou Road,Chuzhou City,Anhui Province, P.R China.
<b>Trademark</b>	
<b>Product</b>	Plastic Sheet&Plate&Film Extrusion Line
<b>Model No.</b>	JWZN25, JWZN30, JWZN35, JWZN45, JWZN50,JWZN55,JWZN60, JWZN65, JWZN70, JWZN75, JWZN80, JWZN90, JWZN100, JWZN105, JWZN120, JWZN130, JWZN150, JWZN160, JWZN170, JWZN180, JWZN200, JWZN220, JWZN250, JWZN300, JWZN350, JWZN400, JWZN450, JWZN500, JWZS45, JWZS55, JWZS65, JWZS72, JWZS80, JWZS92, JWZS95, JWZS98, JWZS110, JWZS115, JWZTP75, JWZTP90, JWZTP93, JWZTP107, JWZTP120, JWZTP130, JWZTP135, JWZP25, JWZP35, JWZP52, JWZP75, JWZP85, JWZP95, JWZP110, JWZP120, JWZP135
<b>Rated Voltage</b>	400V
<b>Rated Frequency</b>	50HZ
<b>Specifications</b>	See the Specification tables listed in Annex A.2
<b>Equipment Mobility</b>	stationary
<b>Duty Cycle</b>	continuous
<b>File No.</b>	JWELL-230323
<b>Issued Date</b>	March 29, 2023

## **Part I: General**

1.1 General description

1.2 The certificate of relevant components

1.3 Applicable standard

## 1.1 General description

## 1.2 The certificate of relevant components

伺服电机



# CERTIFICATE

No. B 04 06 22021 150

Holder of Certificate: **Yaskawa Electric Corp.**  
**Tokyo Plant**  
450 Kamifujisawa, Inama  
Saitama 358-8566  
Japan

Certification Mark:



Product: **Electric motor**  
**AC Servo Motor**

The product was tested on a voluntary basis and complies with the essential requirements.  
The certification mark shown above can be affixed on the product. See also notes overleaf.

Test report no.: **73509931**



Date: **2004-06-18**

Page 1 of 24

TÜV PRODUCT SERVICE GMBH - Zertifizierungsstelle - Hildnerstrasse 65 - D-80339 München  
Gruppe TÜV Süddeutschland

06/09 2007 10:46 FAX

ZERTIFIKAT · CERTIFICATE

# C Certificate of Conformity

No.: E9 98 09 22021 045



concerning the EMC protection requirements in accordance with Article 10 of the Council Directive 89/336/EEC on electromagnetic compatibility for

Yaskawa Electric Corporation  
Tokyo Plant  
480 Kamifujisawa, Iruma-Shi  
Saitama 353-8585  
Japan

Item Identification: Industrial Scientific and Medical Equipment  
SGDM-<sup>DA</sup>DA, SGDM-<sup>ME</sup>ME series  
(see Attachment 1 & 2 for grouping)

Item Description: AC Servo Amplifier (AC SERVOPACK)  
100-110VAC, 200/230VAC, 30W-3kW  
Protection class I

Project-/TCF No.: TYOEMC05309A

This Certificate of Conformity was issued in accordance with Article 10.2 of the Council Directive 89/336 EEC on the harmonization of the laws of the Member States relating to electromagnetic compatibility. It was transposed into the "Gesetz über die elektromagnetische Verträglichkeit von Geräten vom 9. November 1992 (EMVG, § 5.2)" in Germany. This certificate does not contain any statements pertaining to the EMC protection requirements governed by other laws which serve to implement EC Directives other than the aforementioned Council Directive 89/336 EEC. This certificate or the technical report refers only to the tested sample or product family listed in the above mentioned Project-/TCF documentation.

This certificate does not permit the use of a TÜV PRODUCT SERVICE certification mark on the tested product.

Released with the above mentioned certificate number by the certification body of TÜV PRODUCT SERVICE.

*Robert Binder*  
Robert Binder  
Str. des Lufers  
der Zuständigen Stelle  
TYOEMC/Robert Binder  
09.09.1998

Department:  
Date:

TÜV Product Service GmbH is Competent Body in accordance with EMC Directive 89/336/EEC (EMPT VFG, #1/1992).



TÜV PRODUCT SERVICE GMBH · Zertifizierstelle · Ridlerstrasse 31 · D-80339 München

08/09 2004 10:44 FAX

# CERTIFICATE

No. B.04.05 22021 147



Holder of Certificate: **Yaskawa Electric Corp.**  
**Tokyo Plant**  
480 Kamata-1-chome, Itama  
Saitama 358-8555  
Japan

Certification Mark:



Product: **AC servo systems**  
**AC Servo Amplifiers**

The product was tested on a voluntary basis and complies with the essential requirements.  
The certification mark shown above can be affixed on the product. See also notes overleaf.

Test report no.: 73502491



Date: 2004-06-01

Page 1 of 17

TÜV PRODUCT SERVICE GMBH - Zertifizierungsstelle - Rildlarstrasse 65 - D-90339 München  
Gruppe TÜV Sddeutschland

06/08 2004 10:44 FAX

# EC Certificate of Conformity



No.: E9 98 06 22021 040

concerning the EMC protection requirements in accordance with Article 10 of the Council Directive 89/336/EEC on electromagnetic compatibility for

Yaskawa Electric Corporation  
Tokyo Plant  
480 Kamifujinawa, Inuma-Sai  
Saitama 338-8555  
Japan

Item Identification: Industrial Scientific and Medical Equipment  
SGMAH, SGMPH series (see Attachment 1 for grouping)

Item Description: AC Servo Motors  
30V-750W, 100W-4.5kW  
Protection class I

Project-/TCF No.: TYOEMC04845A

This Certificate of Conformity was issued in accordance with Article 10.2 of the Council Directive 89/336 EEC on the harmonization of the laws of the Member States relating to electromagnetic compatibility. It was transposed into the "Gesetz über die elektromagnetische Verträglichkeit von Geräten vom 9. November 1992 (EMVG, § 5:3)" in Germany. This certificate does not contain any statements pertaining to the EMC protection requirements governed by other laws which serve to implement EC Directives other than the aforementioned Council Directive 89/336 EEC. This certificate or the technical report refers only to the tested sample or product family listed in the above mentioned Project-/TCF documentation.

This certificate does not permit the use of a TUV PRODUCT SERVICE certification mark on the tested product.

Released with the above mentioned certificate number by the certification body of TUV PRODUCT SERVICE

*Robert Binder*  
Robert Binder  
Spv. des Leiters  
ex zuständiger Stelle  
TYOEMC/Robert Binder  
02.08.1998



Department:  
Date:

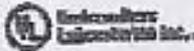
TUV Product Service GmbH is Competent Body in accordance with EMC Directive 89/336/EEC (EMPT VFG, 91/1192).

TUV PRODUCT SERVICE GMBH - Zertifizierstelle - Ridlerstrasse 31 - D-80339 München

06/09 2004 10:42 FAX

NMMS144620 - Power Conversion Equipment

1/3 1-2



**NMMS144620**  
**Power Conversion Equipment**  
**Quotation**

Page Number

**Power Conversion Equipment**

**Guide Information**

0164620

**MATSHUSITA ELECTRIC INDUSTRIAL CO LTD**  
**800708 D1Y**  
**7-1-1 MORORUKU**  
**DAITO-SHI**  
**OSAKA 574-0044, JAPAN**

Open type AC servo amplifier, Model DSU, followed by XXX, followed by 004, 022, 022, or 018, followed by 3, followed by MGP or XXXL, followed by XXXXX or XXXXX, where X can be any alphanumeric character.

Open type AC Servomotor, Model MSH, MPD or MSH followed by JDA, JDA or 23A, followed by an alphanumeric, followed by V, VD or VHS, followed by a two digit number, letters and/or digits Model K700SLA300LA700SLA700SLA, K120SLA700SLA, K300SLA700SLA, K700SLA700SLA, where X can be any alphanumeric character.

Open type AC Servo drive, Minor A Series, Model MDA, MDA, MDA, MDA, MDA, MDA, MDA and MDA 1A, 2A, 3A, 5A, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, followed by 1, 2, 3 or 5, followed by up to a five digit alphanumeric suffix.

<http://datacenter.com/cgi-bin/xtv/sample/USEXT/IFRAME/through.html?name=NMMS144620&other100g=Power+Conversion> 06/20/02

2004-02-14 14:43 FROM:SHANGHAI POWER AUTO 662163572682 P:1



SHANGHAI POWER AUTO - Power Conversion Equipment

2/3

Series Mima OF, Model MAD followed by 01, followed by T1, followed by 1 or 2, followed by 05 or 01.

Series DV, Model DVXXXXXAF11.

Open type AC motor driver, Model AHE, Model MAD or MDD followed by C, followed by T1 or T5, followed by 1, 3 or 5, followed by 07, 05, 02, 03, 14 or 24, may be followed by up to three alphanumeric suffix; Series MONAS C, Models MAR, MDR, MFD, MGD, MHD or M50 followed by C, followed by 01, 02, 03, 04, 05, 06, 08, 09, 10, 15, 3A or 5A, followed by 1, 3 or 5, followed by A or D, followed by 3 or 4, may be followed by up to three alphanumeric suffix.

Series Mima J, Model MAD or MDD followed by R, followed by T1 or T5, followed by 1, 3 or 5, followed by 01, 05, 07, 12, 16 or 25, may be followed by up to three alphanumeric suffix.

MDDXX Series, Model MDD followed by 0A1, 0A2, 0A1, 0A3, 011, 013, 021, 023, 041, 043 or 091, followed by a letter A through Z, followed by the number 1, followed by two letters, followed by A through Z or 00 through 99.

MDDZ Series, Model MDDZ followed by 0A, 0A, 01, 02, 04, or 08, followed by 1 or 3, followed by A, M, R, or J, followed by 1 or 2, followed by A, B, C or S, may be followed by two digits, numbers and/or letters.

MDS Series, Model MDS followed by 0B, 1A, 2A, 5A, 5A, 01, 02, 04, or 08, followed by 1 or 3, followed by A, P, or 2, followed by 1 or 2, followed by 7P, 7PM or 7D, may be followed by two digits, numbers and/or letters.

MDS Series, Model MDS followed by M or P, followed by 0A, 01, 02, 04 or 08, followed by 1, 3, or 5, followed by up to eight alphanumeric suffix.

MDS00LA Series, Model MDS00LA followed by 001, 005, 010, 020, 040, 070, 100, followed by 1 or 2, followed by A.

DMDD1-W Series, Model DMDD1-W followed by 01, 02, 04, or 08, followed by 1 or 2 and suffixed by X. (X can be replaced with any alphanumeric).

DMDD2-W Series, Model DMDD2-W followed by 01, 02, 04, or 08, followed by X, followed by 01, followed by 2A, followed by 15, followed by 07, 20, 30 or 21.

MQDC Series, Model MQDC followed by 0A, 0A, 01, 02, 04, or 08, followed by 1 or 3, followed by A, M, H, or I, followed by 1 or 2, followed by A, B, C or S, may be followed by two digits, numbers and/or letters.

MQS Series, Model MQS followed by 0B, 1A, 2A, 3A, 5A, 01, 02, 04, or 08, followed by 1 or 3, followed by A, P, or 2, followed by 1 or 2, followed

<http://data.industry.com/cp/ind/XYV/Products/CEEXT/1/PURMID/Showpage.asp?name=SHANGHAI%20POWER%20CONVERSION%20EQUIPMENT> 04/02/02

2004-02-02 10:44 REC: 19274-6-00 117 0

TUV Rheinland  
Product Safety GmbH  
Al Graven Stein  
D-51106 ESln

Certificate No.:  
R 9650904

Our Reference:  
943-MR/eI- E9660900E02  
(to be filled in by TUV Rheinland)

Appendix No.:  
1

Constructional data for electrical appliances

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(only in addition to page

Licenceholder: Matsushita Electric Ind. Co., Ltd., Motor Div.  
Type of appliance: AC Servo Driver  
Type or Model No.: See below.

TYPE	Input			Output				WIND	FREQ	*FN
	IV1	IB1	IA1	IV1	IA1	IB1	IC1			
MSD01A1XX	AC100-120	50/60	1.0	32	1.0	0-333.3	30	50/150/130	0.9	N
MSD02A1XX	AC100-120	50/60	1.4	42	1.0	0-333.3	50	50/150/130	0.9	N
MSD011A1XX	AC100-120	50/60	2.2	80	1.8	0-333.3	100	50/150/130	0.9	N
MSD021A1XX	AC100-120	50/60	3.7	90	2.8	0-333.3	200	65/180/130	1.0	N
MSD041A1XX	AC100-120	50/60	4.8	82	4.4	0-333.3	400	65/180/170	1.2	N
MSD03A1XX	3AC200-230	50/60	0.31	37	1.0	0-333.3	30	50/150/130	0.9	N
	AC200-230	50/60	0.64	37	1.0	0-333.3	50	50/150/130	0.9	N
MSD04A1XX	3AC200-230	50/60	0.40	42	1.0	0-333.3	50	50/150/130	0.9	N
	AC200-230	50/60	0.69	42	1.0	0-333.3	50	50/150/130	0.9	N
MSD012A1XX	3AC200-230	50/60	0.70	84	1.0	0-333.3	100	50/150/130	0.9	N
	AC200-230	50/60	1.10	84	1.0	0-333.3	100	50/150/130	0.9	N
MSD022A1XX	3AC200-230	50/60	1.1	92	1.7	0-333.3	200	50/150/130	0.9	N
	AC200-230	50/60	1.2	92	1.7	0-333.3	200	50/150/130	0.9	N
MSD042A1XX	3AC200-230	50/60	1.8	106	3.5	0-333.3	400	65/150/130	1.0	N
	AC200-230	50/60	2.2	106	2.8	0-333.3	400	65/150/130	1.0	N
MSD053A1XX	3AC200-230	50/60	4.8	116	4.3	0-333.3	750	85/150/170	1.2	N
	AC200-230	50/60	3.7	116	4.3	0-333.3	750	85/150/170	1.2	N
MSD102A1V	3AC200-230	50/60	4.2	87.9	7.2	0-333.3	1000	95/220/205	3.9	F
MSD183A1V	3AC200-230	50/60	8.1	105.4	9.4	0-333.3	1500	120/220/205	4.5	N
MSD203A1V	3AC200-230	50/60	7.9	89.8	10.4	0-333.3	2000	120/220/205	4.3	F
MSD253A1V	3AC200-230	50/60	10.1	103.6	16.5	0-333.3	2500	120/220/205	4.3	F
MSD083A1V	3AC200-230	50/60	3.2	99.9	5.1	0-333.3	750	95/220/205	3.9	N
MSD103A1V	3AC200-230	50/60	4.2	117.4	5.8	0-333.3	1000	95/220/205	3.9	N
MSD153A1V	3AC200-230	50/60	6.0	102.6	9.4	0-333.3	1500	120/220/205	4.5	N
MSD203A1V	3AC200-230	50/60	8.1	106.4	12.4	0-333.3	2000	120/220/205	4.3	F
MSD253A1V	3AC200-230	50/60	10.0	118.4	13.9	0-333.3	2500	120/220/205	4.3	F
MSD083A1V	3AC200-230	50/60	3.3	110.7	5.1	0-333.3	750	95/220/205	3.9	N
MSD153A1V	3AC200-230	50/60	6.0	99.5	9.0	0-333.3	1500	120/220/205	4.5	N
MSD253A1V	3AC200-230	50/60	10.2	125.2	13.9	0-333.3	2500	120/220/205	4.3	F
MSD053A1V	3AC200-230	50/60	2.1	101.4	3.2	0-333.3	500	95/220/205	3.9	N
MSD103A1V	3AC200-230	50/60	4.1	117.4	5.8	0-333.3	1000	95/220/205	3.9	N
MSD153A1V	3AC200-230	50/60	6.0	102.6	9.6	0-333.3	1500	120/220/205	4.5	N
MSD203A1V	3AC200-230	50/60	8.1	103.2	12.4	0-333.3	2000	120/220/205	4.3	F

\*W: dimensions [mm]; \*KG: weight [kg]; \*FN: fan motor;  
N: not provided; F: provided.

Köln, den 06.11.1994  
TUV Rheinland  
Product Safety GmbH

Osaka, Japan  
(Place)  
MATSUSHITA ELECTRIC IND CO LTD MOTOR DIV  
(Stamp and Signature of Licenseholder)

20.10. 1994  
(Date)  
Nobuo Yamada  
Nobuo Yamada

# CERTIFICATE

# TUV

## of Conformity

Low Voltage Directive 73/23/EEC  
as last amended by EEC Directive 93/68/EEC

Registration No.: AN 2057299 01

Report No.: E 9884194 E 01

Holder: Chyun Tsen Industrial Co., Ltd.  
No. 18, Lane 811  
Li-Ming Rd., Sec. 1  
Nantun Dist., Taichung 408  
TAIWAN

Product: MOTOR  
(Induction Cage Motor)

Identification: CB2-4380, C01-4380, C02-4380, C03-4380,  
C05-4380, C08-4380, C10-4380, C15-4380,  
C20-4380, CB4-4382, CB2-4382, C01-4382,  
C01-4120  
Serial number: Prototype

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the License Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 73/23/EEC in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.

Certification Body



*R. Kasmierczak*  
Dipl.-Ing. R. Kasmierczak

Cologne, 30.05.2000

TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln

Ⓒ The CE marking may be used if all relevant and effective EC Directives are complied with. Ⓒ

: 依恒液压

FAX NO. : 69892528

Mar. 07 2002 01:40 P1



# CERTIFICATE

**of Conformity**  
**Low Voltage Directive 73/23/EEC**  
**as last amended by EEC Directive 93/68/EEC**

**Registration No.:** AN 2133593 01

**Report No.:** E 2131503 E 01

**Holder:** Shanghai Hai Guang Electric  
**Machine Works**  
 Zhe Lin Fengxian  
 Shanghai 201424  
 P. R. CHINA

**Product:** MOTOR  
 (3 Phase Induction Motor)

**Identification:** Type Designation : Y series 3 Phase Induction Motors  
 Ratings : See Appendix 1  
 Serial Number : See Appendix 1

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 73/23/EEC, in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.

Certification Body



# C E R T I F I C A T E



of Conformity  
 Low Voltage Directive 73/23/EEC  
 as last amended by EEC Directive 93/68/EEC

Registration No.: AN 50018932 0001

Report No.: 15002266 001

Holder: Wuxi Fujie Electronics Co., Ltd.  
 Wuxi Newly Developed Area  
 Shuofang Industrial Park  
 Jiangsu 214142  
 P.R. China

Product: Transformer  
 (Three Phase Separating Transformers)

Identification: Type Designation: SG Series  
 Serial No. : n.a.  
 Remark: Please refer to testreport 15002266 001 for details.

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all revision of Annex I of Council Directive 73/23/EEC, in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.



Certification Body

Dipl.-Ing. F. Mücking

Cologne, 08.01.2003

TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln





**TÜV  
Rheinland**

# CERTIFICATE

## of Conformity

Low Voltage Directive 73/23/EEC  
as last amended by EEC Directive 93/68/EEC

Registration No.: AN 9859812 01

Report No.: E 9832848 E 01

Holder: Zhejiang Woilong Group Co.  
Economic Development Zone  
Shengyu, Zhellang 312300  
P. R. CHINA

Product: MOTOR  
(3 Phase Induction Motor)

Identification: Type Designation: Y series 3 Phase Induction Motor  
Ratings : See Appendix 1  
Serial Number : See Appendix 1

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 73/23/EEC, in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.

Certification Body

Cologne, 29.12.98



*J. Peiffer*  
Dipl.-Ing./J. Peiffer

TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln

FROM :

PHONE NO. :

NOV. 23 1999 09:27PM PE

AN 9859912

90143-ZH/vy-E9832848201

1(1/3)

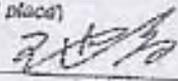
Am Grauen Stein  
D-51105 Köln(Von der Prüfstraße auszufüllen! To be filled in by PRG.)  
In 2 facher Ausfertigung einzureichen / Please submit in duplicate

  
TUV Rheinland

Modell	Output (KW)	Current (A)	Voltage (V)	Speed (r/min)	Eff. (%)	Power factor	Locker rotor torque / rated torque	locked rotor current / rated current	Break-down torque / Rated torque	IP degree	Insulation class	Serial No
Y5612	0.09	0.32	380	2800	62	0.68	2.3	6	2.4	IP 55	F	10001
Y5622	0.12	0.38	380	2800	67	0.71	2.3	6	2.4	IP 55	F	10006
Y5614	0.06	0.28	380	1400	56	0.58	2.4	6	2.4	IP 55	F	10008
Y5624	0.09	0.38	380	1400	58	0.51	2.4	6	2.4	IP 55	F	10010
Y6312	0.18	0.53	380	2800	69	0.75	2.3	6	2.4	IP 55	F	10014
Y6322	0.25	0.67	380	2800	72	0.78	2.3	6	2.4	IP 55	F	10018
Y6314	0.12	0.48	380	1400	60	0.63	2.4	6	2.4	IP 55	F	10022
Y6324	0.18	0.65	380	1400	64	0.66	2.4	6	2.4	IP 55	F	10024
Y7112	0.37	0.95	380	2800	74	0.8	2.3	6	2.4	IP 55	F	11237
Y7122	0.55	1.35	380	2800	76	0.82	2.3	6	2.4	IP 55	F	11240
Y7114	0.25	0.83	380	1400	67	0.68	2.4	6	2.4	IP 55	F	11242
Y7124	0.37	1.10	380	1400	70	0.72	2.4	6	2.4	IP 55	F	11244
Y7116	0.18	0.74	380	910	59	0.63	2	5.5	2	IP 55	F	11246
Y7126	0.25	0.94	380	910	63	0.64	2	5.5	2	IP 55	F	11248
Y7118	0.09	0.50	380	680	49	0.55	1.8	4.5	1.9	IP 55	F	11250
Y7128	0.17	0.63	380	680	52	0.55	1.8	4.5	1.9	IP 55	F	11245
Y801-2	0.75	1.80	380	2830	75	0.84	2.2	6.5	2.3	IP 55	F	10030
Y802-2	1.1	2.5	380	2830	77	0.86	2.2	7	2.3	IP 55	F	10032
Y801-4	0.55	1.5	380	1390	73	0.76	2.4	6	2.3	IP 55	F	10034
Y802-4	0.75	2.0	380	1390	75	0.78	2.3	6	2.3	IP 55	F	10003
Y905-2	1.5	3.4	380	2840	78	0.85	2.2	7	2.3	IP 55	F	20210
Y901-2	2.2	4.8	380	2840	81	0.86	2.2	7	2.3	IP 55	F	20212
Y905-4	1.1	2.6	380	1400	78	0.78	2.3	6.5	2.3	IP 55	F	20214
Y901-4	1.5	3.7	380	1400	79	0.79	2.3	6.5	2.3	IP 55	F	20240
Y905-6	0.75	2.3	380	910	73	0.7	2	5.5	2.2	IP 55	F	20217
Y901-6	1.1	3.2	380	910	74	0.72	2	5.5	2.2	IP 55	F	20214
Y100L-2	3	6.4	380	2870	82	0.87	2.2	7	2.3	IP 55	F	20213
Y100L-4	2.2	5.0	380	1430	81	0.82	2.2	7	2.3	IP 55	F	20225
Y100L-2-4	3	6.8	380	1430	83	0.81	2.2	7	2.3	IP 55	F	20227
Y100L-6	1.5	4.0	380	940	78	0.74	2	6	2.2	IP 55	F	20229
Y100L-1-8	0.75	2.6	380	710	70	0.64	2	5.5	2	IP 55	F	20230
Y100L-2-8	1.1	3.7	380	710	70	0.65	2	5.5	2	IP 55	F	20232
Y112M-2	4	8.2	380	2890	86	0.87	2.2	7	2.3	IP 55	F	30002
Y112M-4	4	8.8	380	1440	85	0.82	2.2	7	2.3	IP 55	F	30004
Y112M-6	2.2	5.6	380	940	81	0.74	2	6	2.2	IP 55	F	30006
Y112M-8	1.5	4.8	380	710	73	0.66	2	5.5	2	IP 55	F	30008
Y132S1-2	5.5	11.1	380	2900	86	0.88	2	7	2.3	IP 55	F	20219
Y132S2-2	7.5	15.0	380	2900	86	0.89	2	7	2.3	IP 55	F	20222
Y132S-4	5.5	11.7	380	1440	86	0.84	2.2	7	2.3	IP 55	F	20224
Y132M-4	7.5	15.4	380	1440	87	0.85	2.2	7	2.3	IP 55	F	20226

Köln, den 23. 10. 1998

(Ort / place)



(Datum / date)

25/10/1998

TUV Rheinland  
Product Safety GmbH

(Stempel und Unterschrift des Antragstellers / stamp and signature of applicant)



# CERTIFICATE

## of Conformity

Low Voltage Directive 73/23/EEC  
as last amended by EEC Directive 93/68/EEC

Registration No.: AN 2133593 01

Report No.: E 2131503 E 01

Holder: Shanghai Hai Guang Electric  
Machine Works  
Zhe Lin Fengxian  
Shanghai 201424  
P. R. CHINA

Product: MOTOR  
(3 Phase Induction Motor)

Identification: Type Designation : Y series 3 Phase Induction Motors  
Ratings : See Appendix 1  
Serial Number : See Appendix 1

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex I of Council Directive 73/23/EEC, in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.

Certification Body

Cologne, 19.04.2001



*F. Nispel*  
Dipl.-Ing. Frank Nispel

TÜV Rheinland Product Safety GmbH - Am Grauen Stein - D-51105 Köln

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

82826569

李海光



73/23/EEC and 89/334/EEC are proved by full compliance with the following standards:

harmonised European standards:

Reference-number	Date of issue
EN 60947-1	02.99
EN 60947-1/A1	11.00
EN 60947-1/A2	12.01
EN 60947-2	06.03
EN 60947-4-1	02.01
EN 60947-5-1	11.97
EN 60947-5-1/A1	08.99
EN 60947-5-1/A2	01.00

**OMRON**

ERYY005 A

## EC Declaration of Conformity

We hereby declare that following product is in conformity with the requirements of the following EC directives.

Product : Relay

Type MY, MY (S) series Relay and  
its accessories type PYF-E, PYF-N series relay socket

No. of Directive : 73/23/EEC

Title of Directive : LVD (electrical equipment designed for use within  
certain voltage limits)

This product is designed and manufactured in accordance with the following standards:

Electrical safety : DIN IEC 255 Teil 1-00 / DIN VDE 0435 Teil 201 / 05.83;  
DIN VDE 0435 Teil 201 A1/05.90  
DIN IEC 255 Teil 0-20 / DIN VDE 0435 Teil 120 / 10.81  
DIN VDE 0110 Teil 1 / 01.89 (IEC664/80, IEC664A/81)

Note : Regarding spacings, the products meet at least above standards' requirements in overvoltage category I (1500V) of MY and category II (2500V) of MY(S) Series Relay. Some of that may have some limitation in their voltage ratings.

Year of CE marking (LVD) : '97 of MY, and '98 of MY(S) Series Relay.

Manufacturer :

Name : Omron Corporation Relay Division  
Address : 28th Floor, Crystal Tower 1-2-27, Shiomi, Chuo-ku  
Osaka, 540 Japan

Date : Nov 22, 1999

Signed : Kazuo Tsuchisaka  
Kazuo Tsuchisaka  
Division Manager

Representative in EU :

Name : Omron Electronics Limited  
Address : 1 Apsley Way Staples Corner London NW2 7HF  
Date : , 1999

Signed : Lac Nye 10/12/99  
Lac Nye  
C&C Division Manager

石:袁个组  
fr: Sunary

03

### Declaration of Conformity

On the 1<sup>st</sup> Apr '02, the company name has been changed from Hitachi Ltd. to following company name. In accordance with company name change, this declaration was modified. But inverter type and its specifications have not happened any changes. The former company name may sometime meet in this technical construction file but it does not to be replaced its sheet.

We: Hitachi Industrial Equipment Systems Co., Ltd.  
(Former company name: Hitachi, Ltd. Industrial Components & Equipment)  
1-1, Higashinarashino 7-chome, Narashino-shi, Chiba 275-8611, Japan,  
declare in our sole responsibility that the following products conform to all the relevant provisions.

Products Name: AC inverters, SJ300 and L300P  
Three phase, 200-240VAC, 50/60Hz, 75 kW  
Three phase, 380-480VAC, 50/60Hz, 75 - 132 kW  
Models Covered: Model S: 300, followed by -750, -900, -1100, -1320;  
followed by HF; followed by any one letter or number or none.  
Model L: 00P, followed by -750, -900, -1100, -1320;  
followed by HF; followed by any one letter or number or none.  
Model L: 00P, followed by -750; followed by LF;  
followed by any one letter or number or none.

Council Directives: Low Voltage: 73/23/EEC  
Amendment directive of above directive 93/68/EEC  
EMC : 89/336/EEC

Applicable standards: LVD: EN50178 (1997)  
EN60204-1 (as reference)  
EN60950 (as reference)  
MC : EN61800-3 (1996)

Year to begin affixing CE marking : 2001

Representative in EU : Hitachi Europe GmbH  
Am Seestero 18  
40547 Dusseldorf, Germany

Date of issue : 1, April, 2002  
Place : Chiba, Japan  
Authorized by : Kenji Nandoh  
Kenji Nandoh  
Department Manager  
Quality Assurance Department

(2/2)



Online Certifications Directory

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Power Conversion Equipment

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Power Conversion Equipment

Guide Information

ABB AUTOMATION INC  
16250 W GLENDALE DR  
NEW BERLIN, WI 53151 USA

E124534

AC adjustable, enclosed Type 1, R5 frame size, speed drive, Constant torque Model ACS611 or AW1611 followed by 0025, 0030, 0040, 0050, 0060 or 0070, followed by 5, followed by 0, B, C, D, E, G, H, L, M, N, P, S, T or U, followed by 0, followed by any letter A through Z, followed by 0 or 1, followed by 2 or 7, followed by 0, followed by 0, followed 9 or 0, followed by 0, followed by 1.

AC adjustable, Type 1 R5 frame size, speed drive, Constant torque, Model ACS611 followed by 0075, followed by 5, followed by 0, followed by 0, followed by 0, followed by C, followed by 1, followed by 2, followed by 0, followed by 0, followed by F, followed by 0, followed by 0.

AC adjustable, open type, Type 1 or Type 12, R2-R9 frame size, speed drive, Constant torque Model ADE601 followed by 0006, 0009, 0011, 0016, 0020, 0025, 0030, 0040, 0050, 0060, 0070, 0100, 0120, 0140, 0170, 0210, 0260, 0320 or 0400, followed by 5 or 6, followed by 0 or D, followed by 0, followed by 0, followed by C or D, followed by 0 or 1, followed by 2 or 5, followed by 0, followed by 0, followed by 0 or 9, followed by 0 or 1, followed by 0, A, B, C, D, E or S.

AC adjustable, open type, Type R3, R9 frame size, speed drive, Constant torque Model ACC604, ACP601, ACS604 or ACX624 followed by 120, 0140, 0170, 0210, 0260, 0320 or 0400, followed by 2, 3, 4, 5 or 6, followed by 0, followed by 0, followed by A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, Y or Z, followed by 0, followed by 0 or 6, followed by 0, followed by 0, followed by 9, followed by 0, followed by 0.

AC adjustable, open, Type R1-R4 frame size speed drives, Constant torque Model ACS401 followed by 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G or H, followed by 004, 005, 006, 009, 011, 016, 020, 025, 030, or 041, followed by 1, 2 or 3, followed by 2, 5 or 6.

Variable torque Model ACH401 followed by 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G or H, followed by 004, 005, 006, 009, 011, 016, 020, 025, 030 or 041, followed by 1, 2 or 3, followed by 2 or 5.

**Accessories - Option modules, Models NAIO-02, NCSA-01, NDIO-01, NDNA-01, NIBA-01, NMBA-01, NMFA-01, NMBP-01, NPBA-02, NTAC-02** are open type internally mounted devices for the R4, R5, R6, R7 frame sizes and externally mounted for the R2, R3, R8, R9 frame sizes. One module can be powered by the 24 V dc, 300 mA supply on the NIOC-01 PCB Terminal X23. If more than one module is selected, an external UL Recognized power supply rated 1 A, 24 V dc output must be used. The secondary circuit of the supply must be fused at 4 A or less.

**Accessories-Line reactors, choke type NOCH0120-6, -0260-6, -0400-6, -0760-6, -0016-6, -0030-6, -0070-6.**

**Advanced motor control modules, Models NAMC-11, NDCU-11.**

**Brake choppers, Models NBRA-658, -659, -669, NBRC-51** are open type devices intended to be mounted in an end-use enclosure external to the R8, R9 frame sizes.

**Communication modules, NBAA-01, NFLN-01, NLON-01** are protocol modules. The NBAA-01 is the N2 protocol. The NFLN-01 is the Landis protocol. The NLON-01 is the communication protocol.

**Option modules, Models NAIO-02, NCSA-01, NDCO-03, NDIO-01, NDNA-01, NIBA-01, NMBA-01, NMFA-01, NMBP-01, NPBA-02, NTAC-02** are open type internally mounted devices for the R4, R5, R6, R7 frame sizes and externally mounted for the R2, R3, R8, R9 frame sizes. One module can be powered by the 24 V dc, 300 mA supply on the NIOC-01 PCB Terminal X23. If more than one module is selected, an external UL Recognized power supply rated 1 A, 24 V dc output must be used. The secondary circuit of the supply must be fused at 4 A or less.

**Series ACS800, Enclosed Type 1 or open chassis Types R2, R3, R4 frame size speed drives, constant torque Model ACS800, followed by -01, -01DEMAG, -04 or -U1, followed by -0001, -0002, -0003, -0004, -0005, -0006, -0009, -0011, -0016, -0020, -0025, -0030 or -0040, followed by -2, -3, -5 or -7. May be followed by combination of +L500, +L501, +2\*L501, +L502, +L503, +L509, +L508, +K451, +K454, +K458, +NXXX, +J405, +P901, +E200, +E202, +D150, +H358, +RXXX, +P904.**

**AC adjustable, enclosed Type 1 or open type, R7, and R8 frame size speed drives, constant torque, Model ACS800, followed by -02, -U2, -04, -DEMAG04 or -U4, followed by -0140, -0170, -0210, -0260, -0270, -0300, -0320, -0400, -0440, -0490, -0550, or -0610, followed by -3, -5 or -7. May be followed by any combination of +C111, +D150, +E210, +E202, +E204, +E208, +E209, +F250, +G304, +H351, +H353, +H356, +J405, +K451, +K454, +K458, +L500, +L501, +L502, +L503, +L509, +L508, +L504, +L505, +L506, +NXXX, +P901, +P904, +RXXX.**

**Enclosed Type 1 or open chassis, Types R5, R6 frame size variable speed drive, constant torque Model ACS800 followed by -01, -U1, -01 DEMAG or -04 followed by -0025, -0030, -0040, -0050, -0060, -0070, -0100, -0120, -40 followed by -2, -3, -5 or -7. May be followed by any combination +L500, +L501, +2\*L501, +L502, +L503, +L509, +L508, +K451, +K454, +K458, +N650, +N651, +N666, +N668, +N669, +N671, +N653, +N654, +J405, +P901, +E200, +E202, +D150, +H358, +R700, +R701, +R702, +R703, +R704, +R705, +R706, +R707, +R708, +R709, +R711, +R712, +P904.**

The +NXXX and +RXXX can be any number 0-9.

**LOOK FOR LISTING MARK ON PRODUCT**

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Notice of Disclaimer

Questions?

Accessories - Option modules, Models NAIO-02, NCSA-01, NDIO-01, NDNA-01, NIBA-01, NMBA-01, NMFA-01, NMBP-01, NPBA-02, NTAC-02 are open type internally mounted devices for the R4, R5, R6, R7 frame sizes and externally mounted for the R2, R3, R8, R9 frame sizes. One module can be powered by the 24 V dc, 300 mA supply on the NIOC-01 PCB Terminal X23. If more than one module is selected, an external UL Recognized power supply rated 1 A, 24 V dc output must be used. The secondary circuit of the supply must be fused at 4 A or less.

Accessories-Line reactors, choke type NOCH0120-6, -0260-6, -0400-6, -0760-6, -0016-6, -0030-6, -0070-6.

Advanced motor control modules, Models NAMC-11, NDCU-11.

Brake choppers, Models NBRA-658, -659, -669, NBRC-51 are open type devices intended to be mounted in an end-use enclosure external to the R8, R9 frame sizes.

Communication modules, NBAA-01, NFLN-01, NLON-01 are protocol modules. The NBAA-01 is the N2 protocol. The NFLN-01 is the Landis protocol. The NLON-01 is the communication protocol.

Option modules, Models NAIO-02, NCSA-01, NDCO-03, NDIO-01, NDNA-01, NIBA-01, NMBA-01, NMFA-01, NMBP-01, NPBA-02, NTAC-02 are open type internally mounted devices for the R4, R5, R6, R7 frame sizes and externally mounted for the R2, R3, R8, R9 frame sizes. One module can be powered by the 24 V dc, 300 mA supply on the NIOC-01 PCB Terminal X23. If more than one module is selected, an external UL Recognized power supply rated 1 A, 24 V dc output must be used. The secondary circuit of the supply must be fused at 4 A or less.

Series ACS800, Enclosed Type 1 or open chassis Types R2, R3, R4 frame size speed drives, constant torque Model ACS800, followed by -01, -01DEMAG, -04 or -U1, followed by -0001, -0002, -0003, -0004, -0005, -0006, -0009, -0011, -0016, -0020, -0025, -0030 or -0040, followed by -2, -3, -5 or -7. May be followed by combination of +L500, +L501, +2\*L501, +L502, +L503, +L509, +L508, +K451, +K454, +K458, +NXXX, +J405, +P901, +E200, +E202, +D150, +H358, +RXXX, +P904.

AC adjustable, enclosed Type 1 or open type, R7, and R8 frame size speed drives, constant torque, Model ACS800, followed by -02, -U2, -04, -DEMAG04 or -U4, followed by -0140, -0170, -0210, -0260, -0270, -0300, -0320, -0400, -0440, -0490, -0550, or -0610, followed by -3, -5 or -7. May be followed by any combination of +C111, +D150, +E210, +E202, +E204, +E208, +E209, +F250, +G304, +H351, +H353, +H356, +J405, +K451, +K454, +K458, +L500, +L501, +L502, +L503, +L509, +L508, +L504, +L505, +L506, +NXXX, +P901, +P904, +RXXX.

Enclosed Type 1 or open chassis, Types R5, R6 frame size variable speed drive, constant torque Model ACS800 followed by -01, -U1, -01 DEMAG or -04 followed by -0025, -0030, -0040, -0050, -0060, -0070, -0100, -0120, -40 followed by -2, -3, -5 or -7. May be followed by any combination +L500, +L501, +2\*L501, +L502, +L503, +L509, +L508, +K451, +K454, +K458, +N650, +N651, +N666, +N668, +N669, +N671, +N653, +N654, +J405, +P901, +E200, +E202, +D150, +H358, +R700, +R701, +R702, +R703, +R704, +R705, +R706, +R707, +R708, +R709, +R711, +R712, +P904.

The +NXXX and +RXXX can be any number 0-9.

LOOK FOR LISTING MARK ON PRODUCT

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Notice of Disclaimer

Questions?

AC adjustable, Type 1 or Type 12, R5-R7 frame size speed drives, Variable torque, Model ACH401 or ACH404 followed by 0, 1, 6, B or C, followed by 042, 050, 060, 070, 080, 100, 120 or 140, followed by 1 or 3, followed by 2, 5 or 0.

AC adjustable, open type, R8 and R9 frame size speed drives, Variable torque, Model ACH404 followed by 0, 1, 6, B or C, followed by 170, 210, 260, 320 or 400, followed by 1 or 3, followed by 0.

AC adjustable speed drives, open type, Model ACS followed by 101 or 103, followed by 1H1, -1H6, -1K1, -1K6, -2K1, -2K7, -4K1, -H18, -H25, -H37, -H75, -K18, -K25, -K37, -K75, followed by -1, may be followed by U; Model ACS followed by 141 or 143, followed by -1K1, -1K6, -2K1, -2K7, -4K1, -K18, -K25, -K37 or -K75, followed by -1, may be followed by U; Model ACS followed by 143, followed by -1H1, -1H60R, -1K1, -1K6, -2H1, -2K1, -2K7, -4K1, -H75, or -K75, followed by 3.

AC adjustable, enclosed Type 1, R1-R4 frame size speed drives, constant torque Model ACS550 or variable torque Model ACH550 followed by -01 or -U1, followed by -04A6, -06A6, -07A5, -012A, -017A, -024A, -031A, -046A, -059A, -075A, -088A, -114A, -143A, -03A3, -04A1, -05A4, -06A9, -08A8, -012A, -015A, -023A, -031A, -038A, -044A, -059A, -072A followed by -2 or -4, may be followed by any combination of the following +B056, +L510, +L502, +L512, K451, +K454.

AC adjustable, Enclosed Type 1, R5-R6 frame size speed drives, constant torque Model ACS550 or variable torque Model ACH550 followed by -01 or -U1 followed by -077A, -096A, -124A, -137A, -180A, followed by -3 or -4. May be followed by any combination of +P901, +D1400, +J404, +L510, +K451, +K452, +K454, +K457, +K462, +r700, +R701, +R702, +R703, +R704, +R705, +R706, +R707, +R708, +R709, +R711, +R713, +R714, +P904.

AC adjustable, enclosed Type 1 or open type, R7, and R8 frame size speed drives, constant torque Model ACS550 followed by -02 or -04, followed by -5. May be followed by any combination of options listed in Nomenclature section.

AC adjustable, Type 1, R2-R6 frame size, speed drive, Constant torque Model ACC601, ACP601, ACS601 or ACX624 followed by 0005, 0006, 0009, 0011, 0016, 0020, 0025, 0030, 0040, 0050, 0060, 0070, 0100, followed by 2, 3, 5 or 6, followed by 0, B, C, D, E, H, L, M, N, P, S, T, or U, followed by 0, followed by A, B, C, D, E, F, G, H, I, K, L, M, N, P, Q, R, S, T, U, V, W, X, Y or Z, followed by 0 or 1, followed by 2, 5, 7 or 9, followed by 0, followed by 0, followed by 0, 8 or 9, followed by 0, 1 or R, followed by 0 or 1.

AC adjustable speed drive, enclosed Type 1, Model ACT followed by 143, followed by -4K1, followed by -3, may be followed by U.

AC adjustable, Type 1, R7 frame size, speed drive, Constant torque Model ACC601, ACC604, ACP601, ACS601, ACS604 or ACX624 followed by 0100, 0120 or 0140, followed by 2, 3, 4, 5 or 6, followed by 0, B, C, D, E, H, M, N, P, S, T or U, followed by 0, followed by 0, followed by A, B, C, D, E, F, G, H, J, K, L, M, N, P, Q, R, S, T, U, V, W, X, Y or Z, followed by 0 or 1, followed by 2 or 7, followed by 0, followed by 0, followed by 0 or 9, followed by 0 or 1, followed by B, 0 or 1.

AC adjustable, Type R2-R7 frame size, speed drive, Constant torque Model SD601 followed by -230 or -460, followed by -3, followed by -5, -07, -10, -15, -20, -25, -30, -40, followed by 0, followed by 0, followed by 0.

Accessories - Brake choppers, Models NBRA-653, -663 are Type 12 enclosed, externally mounted device for use with the R2, R3 frame sizes. Models NBRA-654, -655, -656, -657, -664, -665, -666, -667 are open type internally mounted devices for use with the R4, R5, R6, R7 frame sizes.

Previous Page

UL Listed and Classified  
Products

UL Recognized  
Components

Products Certified  
for Canada

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The appearance of a company's name or product in this database does not in itself assure that products so identified have been manufactured under UL's Follow-Up Service. Only those products bearing the UL Mark should be considered to be Listed and covered under UL's Follow-Up Service. Always look for the Mark on the product.

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[Previous Page](#)

**UL Listed and Classified Products**

**UL Recognized Components**

**Products Certified for Canada**

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## DECLARATION DE CONFORMITE DU CONSTRUCTEUR

DAS Contrôle Industriel  
Direction d'Activité PCF

IS : SCHNEIDER ELECTRIC INDUSTRIES SA  
89, Boulevard F. Roosevelt  
92500 Rueil Malmaison  
FRANCE

déclarons sous notre seule responsabilité que le(s) produit(s) :

MARQUE	TELEMECANIQUE
NOM TYPE	Contacteurs LC.K, LP.K, LC.SK, LC.D, LP.D, LC.F, LC.B Contacteurs CR, CV, CE, CS, CG, CC3, CH. Disjoncteurs moteurs GV, GK. Contacteurs auxiliaires CA.K, CA.SK, CA.D, CAD Auxiliaires LA1/2/3/4/6/7/8/9/B, LN1, ZC, GK, GV.A, LAD Relais de protection thermique LR, LT3, LT6. Contacteurs-disjoncteurs "Intégral" LD, LB, C/LD, LB, LB/C/LD Ensemble d'appareillage LE, LG, LF, LC. Interrupteurs-sectionneurs "Vario" V.

auquel(auxquels) se réfère cette déclaration, est(sont) conforme(s) à(aux) :

NORME(S) OU DOCUMENT(S) NORMATIF(S) SUIVANT(S)

EN 60947-1	IEC 947-1	règles générales
EN 60947-4-1	IEC 947-4-1	contacteurs et démarreurs de moteurs
EN 60947-2	IEC 947-2	disjoncteurs
EN 60947-3	IEC 947-3	interrupteurs-sectionneurs
EN 60947-5-1	IEC 947-5-1	contacteurs auxiliaires et auxiliaires
EN 60947-6-2	IEC 947-6-2	matériels à fonctions multiples - ACP
EN 60439-1	IEC 439-1	ensembles d'appareillage
EN 50081-1/2		compatibilité électromagnétique
EN 50082-2		compatibilité électromagnétique
	IEC 34-11	protection thermique incorporée

Sous réserve d'installation, d'entretien et d'utilisation conformes à sa(leur) destination, à la réglementation, aux normes en vigueur, aux instructions du fournisseur et aux règles de l'art, le(les) produit(s) est(sont) conforme(s) aux dispositions de la(des) Directive(s) européenne(s) :

Directive Basses Tension	N° 73/23/CEE
Directive CEM	N° 89/336/CEE

Le marquage CE sur le(les) produit(s) et/ou son(leur) emballage signifie que Schneider Electric tient à la disposition des autorités de l'Union Européenne le(s) dossier(s) technique(s) de référence.

Fait à Rueil-Malmaison - FRANCE : 29 Février 2000

Signataire Autorisé

Nom	E. Beibel
Titre :	Directeur Activité PCP/VVD
Signature :	



GROUPE SCHNEIDER

## MANUFACTURER'S DECLARATION OF CONFORMITY

INDUSTRIAL CONTROL BUSINESS UNIT  
Machine Equipment Activity Management

WE : SCHNEIDER ELECTRIC SA  
40, Avenue A.Morizet  
92100 Boulogne-Billancourt  
FRANCE

declare under our own responsibility that the product(s):

TRADEMARK : TELEMECANIQUE

NAME, TYPE : *Pushbuttons and pilot lights*  
MODELS : XB6 , XB7-B , XA2-B , XB2-M , Domino, XB7-E , XB2-E , XVL...

NAME, TYPE : *Joystick controllers*  
MODELS : XD2-... , XDL-...

NAME, TYPE : *Control stations*  
MODELS : XAL-... , XAP-

NAME, TYPE : *Rotary switches*  
MODELS : X8C-D , K1 , K2

NAME, TYPE : *Illuminated indicator bank*  
MODELS : XVA

to which this declaration refers conform to :

STANDARDS OR NORMATIVE DOCUMENTS

*Low-voltage switchgear and controlgear,*

*General rules* IEC 947-1 (EN60947-1)

*Electromechanical control circuit devices* IEC 947-5-1 (EN60947-5-1)

Subject to installation, maintenance and use conforming to its (their) intended purpose, to the applicable regulations and standards, to the supplier's instructions and to standard practice.

the products conform to the requirements of the applicable European Directives :

*Low-voltage Directive* N° 73/23/EEC

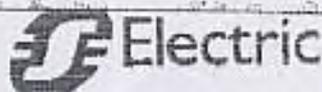
*EMC Directive* N° 89/336/EEC

The CE marking on the products and/or their packaging signifies that Schneider Electric holds the reference technical file available to the European Union authorities.

Issued at Angoulême - FRANCE - September 3 , 1998

Authorised Signatory

Name : Arne Frank  
Title : Activity Director  
Signature :



## MANUFACTURER'S DECLARATION OF CONFORMITY

INDUSTRIAL CONTROL BUSINESS UNIT  
PCP Activity Management

WE: SCHNEIDER ELECTRIC INDUSTRIES SA  
89, Boulevard F. Roosevelt  
92500 Rueil Malmaison  
FRANCE

declare under our own responsibility that the product(s) :

TRADEMARK	TELEMECANIQUE
PRODUCT TYPE	Contactors LC.K, LP.K, LC.SK, LC.D, LP.D, LC.F, LC.B Contactors CR, CV, CE, CS, CG, CC3, CH. Motor circuit-breakers GV, GK. Auxiliary contactors CA.K, CA.SK, CA.D, CAD Auxiliaries LA1/2/3/4/6/7/8/9/B, LN1, ZC, GK, GV.A, LAD Thermal protection relays LR, LT3, LT6. Contactor-breakers "integral" LD, LB/LC/LD, LB, LB/LC/LD Switchgear and controlgear assemblies LE, LG, LF, LC. Switches and disconnectors "Vario" V.

to which this declaration refers, conform to:

THE FOLLOWING STANDARD(S) OR NORMATIVE DOCUMENT(S)

EN 60947-1	IEC 947-1	general rules
EN 60947-4-1	IEC 947-4-1	contactors and motor-starters
EN 60947-2	IEC 947-2	circuit-breakers
EN 60947-3	IEC 947-3	switches and disconnectors
EN 60947-5-1	IEC 947-5-1	control circuit devices
EN 60947-6-2	IEC 947-6-2	multiple function equipment - CPS
EN 60439-1	IEC 439-1	switchgear and controlgear assemblies
EN 50081-1/2		electromagnetic compatibility
EN 50082-2		electromagnetic compatibility
	IEC 34-11	built-in thermal protection

Subject to correct installation, maintenance and use conforming to its(their) intended purpose, to the applicable regulations and standards, to the supplier's instructions and to accepted rules of the art, the product(s) complies(y) with the provisions of the following European Directive(s) :

Low-voltage Directive	N° 73/23/EEC
EMC Directive	N° 89/336/EEC

The CE mark on the product(s) and/or its(their) packaging signifies that Schneider Electric holds the reference technical file(s) available to the European Union authorities.

Issued at Rueil-Malmaison - FRANCE : February 29, 2000

Authorized Signatory

Name :	E. Belbel
Title :	PCP/VVD General Manager
Signature :	

上海欧



ELECTRONIC TECHNOLOGY SYSTEMS  
DR. GEMZ GMBH

# EC DECLARATION OF CONFORMITY

This certifies that the following designated product:

**WIRING TERMINAL  
MODEL NO. : RV**

(Product identification)

complies with the essential protection requirements of Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. This declaration applies to all specimens manufactured in accordance with the attached manufacturing drawings which form part of this declaration. Assessment of compliance of the product with the requirements relating to electromagnetic compatibility was based on the following standards:

**EN 60947-1 : 1999  
EN 61000 - 4 - 2**

(Identifier of regulations / standards)

This declaration is the responsibility of the manufacturer / importer

**YUEQING KAISHITONG TERMINAL BLOCK CO., LTD.  
CHANGDAOTAN VILLAGE LIUSHI TOWN YUEQING CITY,  
ZHEJIANG, CHINA**

(Name / Address)



THIS DOC IS ONLY VALID IN CONNECTION WITH THE TEST REPORT NUMBER : G4M20308-1834-E-16

**MANUFACTURER / IMPORTER**

**TEST LABORATORY**

This is the result of test, that was carried out from the submitted type-samples of a product in conformity with the specification of the respective standards. The certificate holder has the right to fix the CE-mark for EMC on the product complying with the inspection sample.

August 25, 2003

(Date)

(Date)

(Surname, forename:  
(Company stamp)

*Dr. Gemz*

Dr. Gemz  
(Company stamp)



ELECTRONIC TECHNOLOGY SYSTEMS  
DR. GEMZ GMBH

70: 七九五

FR: 大J IV 11 U.S. 8/6X0V60



壳牌可耐压润滑油

Shell Omala Oil

壳牌可耐压高级极压抗泡油采用高粘度指数剂精炼基础油，并加有极压添加剂，抗腐蚀剂，抗氧化剂，抗泡剂，倾点添加剂，主要用于重载工业齿轮润滑。

推荐应用

钢铁行业的齿轮传动系统需要“全极压”的工业齿轮传动装置。

循环和飞溅润滑。

壳牌可耐压润滑油系列。能用于汽车的准双曲线齿轮，在此场合应选用壳牌施倍力车用齿轮油。

性能特征

即使在极不利的条件下，长时间和重负荷工作，由于含有均衡的极压及抗磨损添加剂，这种产品也能有效防止零件表面的磨损，有效保护齿轮和轴承。

具有杰出的热稳定性和抗氧化性能，抵御油液氧化性能，抑制油液氧化性能，即使在某些时候，整体油温高达100°C的情况下，也能延长使用寿命。油的分水性强，机器静止下来后，渗入油箱内的水可以迅速分离。（水通常会加速齿轮和轴承的表面疲劳并促使内表面锈

蚀）具有良好的抗腐蚀性，尤其对于高海拔的环境，可有效防止空气和盐水的腐蚀。抗泡性强，不会形成泡沫。

技术规格

壳牌可耐压润滑油足以满足工业规格：

DIN 51517 的 CLP

AGMA 250.04

典型数据

壳牌可耐压润滑油	68	100	150	220	320	460	680
密度 15°C kg/l	0.871	0.878	0.884	0.89	0.893	0.897	0.913
粘度 40°C mm2	68	100	150	220	320	460	680
粘度 100°C mm2	8.9	11.4	14.8	19.2	24	30.5	36.76
粘度指数	106	101	103	97	95	95	88
闪点 (开口杯) °C	238	242	244	241	244	246	252
倾点 (不高于) °C	-24	-24	-13	1	-9	-9	-9



SGS Fimko Ltd

Särkiniementie 3, P.O. Box 30  
 FIN-00211 Helsinki, Finland  
 Phone +358 9 856 387  
 Fax +358 9 852 5474  
 e-mail: sgs\_fimko@sgs.com

Reference No. **STC-LVD 390 A1**

Internal ref.  
 Tom Törn

Place and date  
 Helsinki 23 September 2003

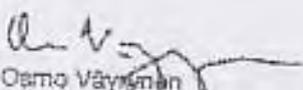
**STATEMENT OF CONFORMITY**

Product	Frequency Converter
Tested on request of	ABB Oy, BAU Drives, P.O. Box 184, FIN-00361 HELSINKI, FINLAND
Manufactured at (name and place)	ABB Oy, Hiemotie 13, FIN-00380 HELSINKI, FINLAND, ABB Inc., Drives & Power Products, 16250 West Glendale Drive, New Berlin, WI 53151, UNITED STATES and ABB Beijing Drive Systems Co., Ltd., Universal Plaza, 10 Jiuxiangao Road, Chaoyang District, BEIJING, 100016, CHINA
Rating and principal characteristics	380...480 V. See Annexes 1 and 2 from Test report no. 225338 / 8
Trade mark (if any)	ABB
Type	ACS550/R5
Additional information (if any)	Class I, IP21. This Statement of Conformity replaces previous Statement of Conformity No. STC-LVD 390, dated 04 September 2003. Two new manufacturing sites in United States and in China have been added.
Sufficient samples of the product have been tested and found to be in conformity with the current standard (number and edition)	EN 50178:1997
As shown in the test report (reference No.)	225338 / 8
Whereby it is found that there is sufficient technical documentation to justify affixing of the CE marking on the product according to the Low Voltage Directive (73/23/EEC) as amended by the Directive (93/68/EEC)	

This Statement has been established by a body notified to the Member States and Commission of the European Communities according to the provisions of Article 11 of the Low Voltage Directive of 19 February 1973.

This Statement of conformity is the result of testing samples of the product, and verifying the documentation in accordance with the provisions of the relevant specific standards and the Low Voltage Directive (73/23/EEC) as amended by the Directive (93/68/EEC). It does not imply an assessment of the whole production, or fulfillment of other additional requirements in the Directive. The affixing of the CE marking presumes in addition that the conditions in annexes III and IV of the Directive are fulfilled.

This statement of conformity is not an FI certificate thus not giving the right to use the FI mark on products, its packaging or any marketing material or activities.

<p>SGS Fimko Ltd</p>  <p>Osmo Väyrynen        Certification Manager</p>	 <p>The form of the CE marking</p>
--	---

CB-DE1 30182



Ref. No. 40017-1200-0717/31947

Testing Station: VDE Testing and Certification Institute

**CB-TEST REPORT FORM-IEC 60898  
CIRCUIT-BREAKERS FOR OVERCURRENT PROTECTION FOR HOUSEHOLD  
AND SIMILAR INSTALLATION**

**TECHNICAL CHARACTERISTIC**

Type:	SSJ6...-7CC20; SSJ6...-8CC20
Number of poles:	1; 1+N; 2; 3; 3+N; 4
Rated operational voltage:	AC 230/400V (poles 1) AC 230V (poles 1+N) AC 400V (poles 2; 3; 3+N; 4)
Rated current:	0,3 A; 0,5 A; 1 A; 1,6 A; 2 A; 2,5 A; 3 A; 4 A; 5 A; 6 A; 8 A; 10 A; 13 A; 16 A; 20 A; 25 A; 32 A; 40 A; 50 A; 63 A
Instantaneous tripping current:	"C" "D"
Rated short-circuit capacity:	6000 A
Energy limiting class:	3 (0,3 A - 40 A; type C)
Grid distance:	35mm

Type listing page 2-3  
Test sequence page 4-5  
Measuring and test equipment page 6

## Declaration of Conformity

On the 1<sup>st</sup> Apr '02, the company name has been changed from Hitachi, Ltd. to following company name. In accordance with company name change, this declaration was modified. But inverter type and its specifications have not happened as y changes. The former company name may sometime meet in this technical construction file but it does not to be registered in sheet.

We: **Hitachi Industrial Equipment Systems Co., Ltd.**  
 (Former company name: Hitachi, Ltd. Industrial Components & Equipment)  
 1-1, Higashimurashino 7-chome, Narashino-shi, Chiba 275-8611, Japan,  
 declare in our sole responsibility that the following products conform to  
 all the relevant provisions.

**Products Name:** AC inverters, SJ300, L300P and SJH300 series  
 Three phase, 200-240VAC, 50/60Hz, 0.4 - 55 kW  
 Three phase, 380-480VAC, 50/60Hz, 0.4 - 55 kW

**Models Covered:** Model SJ300, followed by -004, -007, -015, -022, -037, -040, -055  
 -075, -110, -150, -185, -220, -300, -370, -450 or -550; followed by  
 LF or HF; followed by any one letter or number or none.  
 Model L300P, followed by -004, -007, -015, -022, -037, -040, -055  
 -075, -110, -150, -185, -220, -300, -370, -450 or -550; followed by  
 LF or HF; followed by any one letter or number or none.  
 Model SJH300, followed by -1, -1.5, -2.5, -3.5, -5.5, -8  
 -11, -15, -22, -27, -33, -40, -50, -60 or -75; followed by LF or HF;  
 followed by any one letter or number or none.

**Council Directives:** Low Voltage: 73/23/EEC  
 Amendment directive of above directive 93/68/EEC  
 EMC : 89/336/EEC

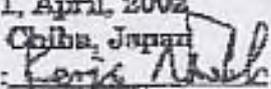
**Applicable standards:** Safety: EN50178 (1997)  
 EN60204-1 (as reference), EN60950 (as reference)  
 EMC : EN61800-3 (1996)

**Year to begin affixing CE marking :** 1999

**Representative in EU :** Hitachi Europe GmbH  
 Am Seestern 18  
 40547 Dusseldorf, Germany

**Date of issue :** 1, April, 2002

**Place :** Chiba, Japan

**Authorized by :**   
 Kenji Nandoh

**Department Manager**  
**Quality Assurance Department**

(20)

Konformitätserklärung



Declaration of Conformity

Wir,

SAMWHA EOCR Ltd.

We,

5th floor, cheil bldg., 24-48, Youngdeungpo-Dong 7Ka,  
Youngdeungpo-Ku, Seoul, Korea

Schneider Electric industries SAS

53 avenue de Chateau - BP 323 FR - 92506 Rueil (Malmaison Cedex)  
France 92506als Hersteller / Lieferant, erklären in alleiniger Verantwort-  
ung, dass die Produkteas manufacturer / distributor, declare under our sole  
responsibility that the products

Elektronische Überstrom Relais

Electronic Over Current Relays

## LR97D... Telemecanique Brand

Nennspannungen

Control (Supply) Voltages

UC24V, UC48V, AC110, AC220V

auf die sich die Erklärung bezieht, mit diesen folgenden  
Norm(en) oder normativen Dokument(en) übereinstimmen:To which this declaration relates and its conformity with the  
following standard(s) or other normative document(s)

EN 60947-1	1994
EN 50081-2	1993
EN 55011	1991
EN 50082-2	1995

und wo anwendbar

and where applicable

EN 60947-1	1997 + A1 + A2
EN 60947-4-1	1992 + A1 + A2
EN 60947-4-2	1996 + A1
EN 60947-5-1	1997 + A11

Gemäss den Bestimmungen der Richtlinien (falls zutreffend)

Following the provisions of Directives (if applicable)

EMV-Richtlinie  
89/336EMC Directive  
03.03.1988Niederspannungsrichtlinie  
73/23Low Voltage Directive  
19.02.1973

Die CE-Kennzeichnung wurde im Jahre 04 angebracht

The CE marking has been added in the year 2004

Ort und Datum der Ausstellung

Place and date of issue

SAMWHA EOCR Test Lab.

5th floor, cheil bldg., 24-48, Youngdeungpo-Dong 7Ka,  
Youngdeungpo-Ku, Seoul, Korea

Schneider Electric SA

Laboratoire d'Expertise et d'Essais - 33 bis, avenue du  
Maréchal Joffre - F-92802 Nanterre Cedex

2004-08-07

Name und Unterschrift des Befugten

Name and signature of authorized person

Mr. Young Jun Kim

Director / R &amp; E Director / R &amp; D

Doc No.	Date	Issue	Rev.	Appr.	Rev.	Doc No.	Doc No.	
0000-0017	14/08/04					DOC / CE		
							Product	LR97D
Samwha EOCR Ltd.							Doc No.	RP04-21-0127-01

石 袁 清 慧  
和 徐 慧 年

认证

### Declaration of Conformity

On the 1st of April 2002 the company name has been changed from Hitachi Ltd. to following company name. In accordance with company name change, this declaration was modified. But inverter type and its specifications have not happened any change. The former company name may sometime meet in this technical construction file but it does not to be related in about.

We: Hitachi Industrial Equipment Systems Co., Ltd.  
(Former company name: Hitachi, Ltd. Industrial Components & Equipment)  
1-1, Higashinarashino 7-chome, Narashino-shi, Chiba 275-8511, Japan,  
declare in our sole responsibility that the following products conform to all the relevant provisions.

- Products Name: AC inverters, SJ100 series  
Single phase, 200-240VAC, 50/60Hz, 0.2 - 2.2 kW  
Three phase, 200-240VAC, 50/60Hz, 0.2 - 7.5 kW  
Three phase, 380-460VAC, 50/60Hz, 0.4 - 7.5 kW
- Models Covered: Model SJ100, followed by -002, -004, -005, -007, -011, -015, -022; followed by N; followed by FE or FU.  
Model SJ100, followed by -037, -055, -075; followed by L; followed by FE or FU.  
Model SJ100, followed by -004, -007, -015, -022, -030, -040, -055, -075; followed by H; followed by FE or FU..
- Council Directives: Low Voltage: 73/23/EEC  
Amendment directive of above directive 93/88/EEC  
EMC : 89/386/EEC
- Applicable standards: Safety: DIN/VDE0160  
EN60204-1(as reference), EN60950 (as reference)  
EMC : EN61800-3 (1996)

Year to begin affixing CE marking : 1996

Representative in EU : Hitachi Europe GmbH  
Am Seppstern 18  
40547 Düsseldorf, Germany

Date of issue : 1, April, 2002  
Place : Chiba, Japan  
Authorized by : Kenji Nandoh  
Kenji Nandoh  
Department Manager  
Quality Assurance Department

1197

**CB TEST CERTIFICATE**  
**CERTIFICAT D'ESSAI OC**

Product  
Produit

Circuit-breaker

Name and address of the applicant  
Nom et adresse du demandeur

Siemens AG Installationstechnik  
Siemensstrasse 10, 93055 Regensburg

Name and address of the manufacturer  
Nom et adresse du fabricant

Siemens AG Installationstechnik  
Siemensstrasse 10, 93055 Regensburg

Name and address of the factory  
Nom et adresse de l'usine

Siemens Circuit Protection Systems Ltd. Shanghai  
90 Jing Zhang Zhi Rd. Zhang Yan, Jin Shan District,  
201514 Shanghai, CHINA

Rating and principal characteristics  
Valeurs nominales et caractéristiques principales

Rated voltage: AC 230/400 V;  $I_{cn} = 6000$  A  
Rated current: 0,3 A - 63 A

Trademark (if any)  
Marque de fabrique (si elle existe)

Siemens

Model / Type Ref.  
Ref. De type

5SJ6...-7CC20; 5SJ6...-8CC20

Additional information (if necessary)  
Information complémentaire (si nécessaire)

Instantaneous tripping current: C, D

A sample of the product was tested and found to be in conformity with  
Un échantillon de ce produit a été essayé et a été considéré conforme à la

PUBLICATION

EDITION

IEC 60898-1(ed.1)

As shown in the Test Report Ref. No. which forms part of this Certificate  
Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat

DE 1 - 30182 by VDE Institute  
40017-1200-0717/31947

This CB Test Certificate is issued by the National Certification Body  
Ce Certificat d'essai OC est établi par l'Organisme National de Certification

**VDE VERBAND DER ELEKTROTECHNIK**  
**ELEKTRONIK INFORMATIONSTECHNIK e.V.**  
**VDE Prüf- und Zertifizierungsinstitut**  
**VDE Testing and Certification Institute**  
Zertifizierungsstelle / Certification

Schippe

Date: 2003-11-19

Signature:



To: 同工 < 1/2 >  
 C&S CE 认证

### DIT- Low voltage Modular DIN system

réf: J.R.DUBUY  
 tel: 04 76 38 41 18  
 E-mail: jean-richard\_dubuy@mail.schneider.fr

objet: Application to the European Directive for MERLIN-GERIN Multi 9 Low Voltage Products/Systems

I, undersigned Jean-Richard DUBUY, responsible for Quality Insurance Department of Low Voltage Final Distribution Activity (DIT), certify by the present letter that the MERLIN-GERIN Multi 9 Low-Voltage products (\*), provided they are installed in accordance with our internal installation and maintenance standards, and constructor specifications are in conformity to European Directives :

- DBT « 73/23/CEE » of february 19th 1973, modified by directive « 93/68/CEE » of july 22th 1993.
- UCEM « 89/336/CEE » of may 3th 1989, modified by « 92/31/CEE » of april 28th avril 1992, modified by directive « 93/68/CEE » of july 22th 1993.
- DITE « 98/19/CE » of february 12th 1998 for equipments designed to be connected to a public telecommunication network.

The CE marking labelled on the products and/or packing delivered after 1th of january 1996 certifies the conformity of our products/systems to the European Regulation.

Grenoble, 25<sup>th</sup> of january 2002

DIT Quality Manager  
 Jean Richard DUBUY

(\*) this apply to the products/systems of our catalogue MERLIN-GERIN Multi 9 :  
 all products, auxiliaries, and accessories  
 enclosures PRAGMA C, D, and F, MINI-PRAGMA, K&EDRA  
 enclosures OPALE, MINI-OPALE,  
 weatherproof enclosures F8 et EK9  
 finishing accessories, terminal blocks, trunking

#### Schneider Electric Industries SA

Adresse postale :  
 Avenue des Jours Clairs, 10000  
 F-92500 Colombes cedex 9  
 Tel : +33 (0) 1 47 87 00 00  
 Fax : +33 (0) 1 47 87 42 77

Service clientèle au capital de 2 700 101 100 F  
 Siège social : 20, Boulevard Franklin D. Roosevelt  
 F-92500 Runy-Malmaison - France  
 004 302 438 RCS Nanterre - code APE 812 A  
 Site : 004 507 459 0000  
 N° Ident. TVA : FR 04 954 903 400





Doc No

R02B940

DECLARATION OF CONFORMITY

We, IDEC IZUMI CORPORATION  
7-31, Nishimiyahara 1-Chome  
Yodogawa-Ku, Osaka 532-8550, Japan

declare under our sole responsibility that the product:

Description: Relays  
Series No.: RU Series  
Model No.: Details are as per attached sheet

to which this declaration relates is in conformity with the EC Directive on the following standard (s) or normative document (s).

Applicable EC Directive: Low Voltage Directive (73/23/EEC)

Applicable Standard(s): EN 61810-1:1998

15 June, 2001 at Osaka, Japan

Hiroshi Sato  
Vice President  
Business Strategy





MILL TEST CERTIFICATE

INSPECTION CERTIFICATE 3.1.B  
SPS-EN 10204 3.1.B

Certificate No.  
Zertifikats Nr.  
N° de certificat

Page  
Seite  
Page

979576/002

1 (02)

Date Order Date

03.11.04

Delivery address, Empfänger, Adresse livraison <b>SHANGHAI</b>		WUXI DAMING METAL PRODUCTS CO., LTD. WUXI STAINLESS STEEL MARKET, NO.999 OF TONGJIANG ROAD, WUXI, JIANGSU, 214191, P.R.CHINA TEL:86 510 3858000						
Requirements, Anforderungen, Exigences <b>ASTM A240-04A</b> <b>ASME 2004 SECTION II PART A SA-240</b>		Our Order No. Ihrer Auftrag Nr. Notre commande n° <b>58065</b>	Your order, Ihre Bestellung, Votre commande <b>INDEMT 3224</b>					
Product, Erzeugnisform, Produit <b>COIL, STAINLESS STEEL</b>		Mark of Manufacturer Zeichen des Lieferanten Signe du fournisseur <b>OUTOKUMPU</b>	Process Herstellungsort Lieu de fusion <b>AOD</b>					
Grade, Werkstoff, Numéro <b>TYPE 304</b>		Tolerances, Tolerances, Tolérances						
Marking, Kennzeichnung, Marquage <b>A/SA-240 304 1</b>		Métro, Mesure, Mesures						
Line Reihe Ligne	Item Position Poste	Charge lot No. Schmelz-Probé Nr. Coulée n°	Size, Abmessungen, Dimensions					
1	4	31948 2	3,0 X 1500 MM					
2	4	33458 1	3,0 X 1500 MM					
3	4	32700 5	3,0 X 1500 MM					
4	4	32702 4	3,0 X 1500 MM					
5	4	33456 6	3,0 X 1500 MM					
Quantity Menge		Weight, Gewicht, Poids						
		22310 KG 1						
		19720 KG 1						
		22670 KG 1						
		22250 KG 1						
		22590 KG 1						
Charge no. Schmelz Nr. Coulée n°	Chemical composition, Chemische Zusammensetzung, Composition chimique							
	C %	Si %	Mn %	P %	S %	Cr %	Ni %	N %
31948	0,023	0,56	1,76	0,029	0,001	18,2	8,2	0,049
33458	0,021	0,44	1,80	0,031	0,002	18,3	8,2	0,046
32700	0,021	0,43	1,73	0,029	0,003	18,2	8,2	0,053
32702	0,023	0,44	1,79	0,029	0,002	18,4	8,2	0,052
33456	0,020	0,49	1,78	0,029	0,002	18,2	8,2	0,058
Line Reihe Ligne	Mechanical properties, Mechanische Eigenschaften, Caractéristiques mécaniques							TENSILE TEST IN ACC TO EN 10002-1 AT ROOM TEMP. IN DELIVERY CONDITION  RPO.2 PROOF STRENGTH RP1.0 PROOF STRENGTH RM TENSILE STRENGTH A50 ELONGATION GL 50 MM A5 ELONGAT. GL PROPORT. SAMPLES PERPENDICULAR TO THE ROLLING DIRECTION
	Location Ort Lieu	Rp0.2 N/mm²	Rp1.0 N/mm²	Rm N/mm²	A5 %	A50 %	Hardness Härte, Dureté HB30	
1	E	312	365	630	57	54	181	
	A	315	361	629	55	52	185	
2	E	312	370	628	54	52	170	
	A	313	369	629	55	53	171	
3	E	317	366	629	57	53	178	
	A	314	361	626	55	52	179	
4	E	312	369	626	55	52	192	
	A	316	368	626	56	52	170	
5	E	305	350	618	58	55	179	
	A	303	348	618	58	55	170	
Identify test, Versuchsbezeichnung, Contrôle d'identification Signe, Abkürzung, Darstellung Surface, Oberfläche, Surface Test of integrity, control, Prüfung auf Integrität, Kontrolle, Taide contrôle, Intégrité		ASTM A262 - 01 PRACTICE E : OK						

MANUFACTURER: OUTOKUMPU STAINLESS OY  
SHIPPING MARKS: DM041014FI040  
SHANGHAI, CHINA  
HEAT TREATMENT 1040 C

We certify that the above mentioned products comply with the terms of the order contract.  
Wir bestätigen, dass die Lieferung den Vereinbarungen der Bestellung entspricht.  
Nous certifions que les produits livrés répondent aux conditions et prescriptions de la commande.

This test certificate is made by computer ACP system and is valid without signature.  
Dieses Zertifikat wurde mit dem automatisierten Datenverarbeitungssystem erstellt und ist ohne Unterschrift gültig.  
Ce certificat a été créé par un système informatique et est valide sans signature.

Outokumpu Stainless Oy

Authorized inspector  
Vertrauensstellenleiter  
Inspecteur autorisé  
**TIMO KAUPILA**

УКРАИНА  
UKRAINEО А О АЛЧЕВСКИЙ МЕТАЛЛУРГИЧЕСКИЙ КОМБИНАТ  
JOINT STOCK COMPANY "ALCHEVSK IRON & STEEL WORKS"94202 г.Алчевск, ул. Шмидта, 4  
тел. : (06442) 9-23-14  
факс: (06442) 9-43-47, 3-71-4794202, Ukraine, Alchevsk, Schmidt str. 4,  
Tel: (06442) 9-23-14  
Fax:(06442) 9-43-47, 3-71-47ЗАВОДСКОЙ СЕРТИФИКАТ КАЧЕСТВА № 77577  
MILL'S QUALITY CERTIFICATE №Дата 10.12.2003  
DateЛист из листов  
Sheet 1 of 1 sheetsСвидетельство о приемочных испытаниях  
Inspection certificate

EN 10204/3.1.

Контракт № 2000-207/1пст-  
Contract № 026/0109-0у-997Заводской заказ № 4354  
Manufacturer's production order №Заказчик: Корпорация "Индустриальный Союз Донбасса" (ИСД)  
для фирмы "Дуферко СА"  
Customer: Corporation "Industrial Union of Donbass" for firm "DUFERCO SA"Барон № 66171125  
RW-car №

LOT 1

Наименование товара:		горячекатаный стальной лист с обрезными кромками			Стандарт:		GB 700 / JIS G3101 JIS G3193 условия контракта	
Description of goods:		hot rolled steel plates with sheared edges			Standard:			
Марка стали		Q235B/SS400						
Grade of steel								
Состояние поставки:		горячекатаный						
Delivery condition:		hot-rolled						
№ поз.ц.	Номера плавков	Номера партий	Размеры, мм			Количество товара, шт/мест	Теоретический вес, тн	
			Толщина	Ширина	Длина			
Item	Cast №	Test №	Thickness	Width	Length	Quantity/pcs	Theoretical weight, tn	
4	7579-1	6474	39.5	2500	6300✓	8	39.072	
4	7579-1	6476	39.5	2500	6300✓	2	9.768	
2	8579-2	6466	49.5	2400	5000	1	4.663	
2	7578-2	6458	49.5	2400	5000	1	4.663	
2	8579-2	6462	49.5	2400	5000	1	4.663	
Total quantity (pcs):			13			Total theoretical weight (tn)		62.929

Выплавка: мартеновский способ производства.  
 Steelmaking process: open hearth furnaces.

Заводской сертификат качества №  
 Mill's quality certificate №

77592

Номер плашки Cast No	Химический состав % Chemical composition, %										Al	N	V	Mo	Ti	As	Nb	CE
	C	Mn	Si	S	P	Cr	Ni	Cu	X 1000									
	X 100		X 1000			X 100			X 1000									
7579-2	15	51	16	28	10	6	4	4	15									
7580-2	16	54	16	30	20	6	3	4	15									
8576-1	15	52	16	29	14	9	7	5	16									
8579-2	15	43	16	32	8	4	5	7	5									

РЕЗУЛЬТАТЫ ИСПЫТАНИЙ

TEST RESULTS

№ партии test №	Испытание на растяжение и ударный изгиб Tensile and impact test										Изгиб Bend												
	Размеры образца Dim. of specimen		Отбор образца Specimen			Температура испытаний Test temperatures C°	Предел теку- чести Yield point ReH N/mm²	Предел прочности Tensile strength Rm. N/mm²	Относ. удли- нение Elonga- tion Lo=50 %	Сужение Reduction of area Z %		1=0) 2=(J/cm²) 3=(%) 4=	Энергия удара KCU Impact energy Ударная вязкость KCU Impact strength Волокнистая составляющая Fibrous appearance Твердость Hardness										
	толщи- на thick- ness, mm	шири- на width, mm	Место, Loca- tion	Нап- равле- ние Direc- tion	Поло- жение Posi- tion																		
	Значения Values																						
6404	∅ 14	∅		T		+20	372	488	24.0														
6484	∅ 14			T		+20	335	459	27.0														sat
6466	∅ 14			T		+20	392	490	24.0														sat
6459	∅ 14			T		+20	343	441	23.0														sat
6485	∅ 14			T		+20	333	455	26.0														sat

Маркировка: сделано в Украине, марка стали, размеры, № плашки, № партии, CHINA, 8000, т.е. знак комбината.  
 Marking: made in Ukraine, grade of steel, dimensions, cast No, test No, CHINA, 8000, mark of the works.  
 Клеймовка: № плашки, марка стали, т.е. знак комбината, 8000 К клеймо.  
 Hard stamp: cast No, grade of steel, mark of the works, 800 K stamp.  
 Цветная маркировка: одна синяя полоса по торцу листа.  
 Color marking: one blue strip on transversal edge of the plate.

Подпись  
Signature

Штамп эксперта  
Expert's stamp

*В. Марусин*

00000102-01 (07)02259-00006170-0100000000

Ref. No. CB-DE1 30182  
40017-1200-0717/31947

**Mess- und Prüfeinrichtungen / measuring and test equipment**

Ident.No.	Type
10583/00	Spannungsmessgerät / voltage measuring instrument
10584/01	Wechselspannungsprüfgerät / alternating voltage test instrument
10291/88	Strommesszange (1 A) / current measuring probe
9058/59/60/88	Koaxialshunt / coaxial shunt
9464/91	Spannungsteiler / voltage divider
10291/93	Strommesszange / current measuring probe
9947/94	Transient Recorder PSO 7030 / transient recorder PSO 7030
10864/02	Temperaturprüfkammer VT 7004 / temperature test cabinet VT 7004
9734/93	Transient Recorder PSO 9070 (P85) / transient recorder PSO 9070
9639/92	Temperaturerfassungssystem Therm 2281-8 / temperature measuring instrument Therm 2281-8
10583/00	Infrarot-Thermometer / infrared thermometer
10861/01	Spannungsteiler / voltage divider
10766/01	Spannungsteiler / voltage divider
10767/01	Spannungsteiler / voltage divider
10669/01	Stromwandler / current transformer
10670/01	Stromwandler / current transformer
10671/01	Stromwandler / current transformer

VDE Testing and Certification Institute  
Section F32  
2003-11-17



Circuit-breaker IEC 60898  
Test sequence

Type: 5SJ6...-7CC20 (I<sub>C</sub> 6 kA)

Number of CB-Test report	Characteristic	Rated current (A)	Number of poles	Testsequence								
				A	B	C	D0	D1	E1	E2	E3	
40017-1200-0717/31947												
-37	C	0.3	1				X**					
-38	C	0.5	1				X**					
-39	C	1	1				X**					
-40	C	1.6	1				X**					
-41	C	2	1				X**					
-42	C	2.5	1				X**					
-43	C	3	1				X**					
-44	C	4	1				X**					
-45	C	5	1				X**					
-46	C	6	1				X**					
-47	C	8	1				X**					
-48	C	10	1				X**					
-49	C	13	1				X**					
-50	C	16	1				X**					
-51	C	16	1+N				X**			X		
-52	C	16	2							X		
-53	C	16	3+N							X		
-54	C	16	4							X		
-55	C	20	1							X		
-56	C	25	1				X**					
-57	C	32	1				X**					
-58	C	32	1+N				X**			X		
-59	C	32	2							X		
-60	C	32	3+N							X		
-61	C	32	4							X		
-62	C	40	1							X		
-63	C	40	1+N				X**			X		
-64	C	40	2							X		
-65	C	40	3+N							X		
-66	C	40	4							X		
-67	C	50	1							X		
-68	C	63	1				X**					
-69	C	63	1+N		X*		X**			X		
-70	C	63	2							X		
-71	C	63	3+N							X		
-72	C	63	4		X*					X		

\*) only clause 9.8

\*\*\*) only clause 9.10.2

**Circuit-breakers 5SJ6... (6 kA)**

Type listing

Pole		Type 5SJ6 ...-7CC20 (LS63 V1)					
		1	2	3	4	1+N	3+N
Characteristic/ Rated current		5SJ6...	5SJ6...	5SJ6...	5SJ6...	5SJ6...	5SJ6...
C	0,3	...114-7CC20	...214-7CC20	...314-7CC20	...414-7CC20	...514-7CC20	...614-7CC20
	0,5	...105-7CC20	...205-7CC20	...305-7CC20	...405-7CC20	...505-7CC20	...605-7CC20
	1	...101-7CC20	...201-7CC20	...301-7CC20	...401-7CC20	...501-7CC20	...601-7CC20
	1,6	...115-7CC20	...215-7CC20	...315-7CC20	...415-7CC20	...515-7CC20	...615-7CC20
	2	...102-7CC20	...202-7CC20	...302-7CC20	...402-7CC20	...502-7CC20	...602-7CC20
	2,5	...100-7CC20	...200-7CC20	...300-7CC20	...400-7CC20	...500-7CC20	...600-7CC20
	3	...103-7CC20	...203-7CC20	...303-7CC20	...403-7CC20	...503-7CC20	...603-7CC20
	4	...104-7CC20	...204-7CC20	...304-7CC20	...404-7CC20	...504-7CC20	...604-7CC20
	5	...111-7CC20	...211-7CC20	...311-7CC20	...411-7CC20	...511-7CC20	...611-7CC20
	6	...106-7CC20	...206-7CC20	...306-7CC20	...406-7CC20	...506-7CC20	...606-7CC20
	8	...108-7CC20	...208-7CC20	...308-7CC20	...408-7CC20	...508-7CC20	...608-7CC20
	10	...110-7CC20	...210-7CC20	...310-7CC20	...410-7CC20	...510-7CC20	...610-7CC20
	13	...113-7CC20	...213-7CC20	...313-7CC20	...413-7CC20	...513-7CC20	...613-7CC20
	16	...116-7CC20	...216-7CC20	...316-7CC20	...416-7CC20	...516-7CC20	...616-7CC20
	20	...120-7CC20	...220-7CC20	...320-7CC20	...420-7CC20	...520-7CC20	...620-7CC20
	25	...125-7CC20	...225-7CC20	...325-7CC20	...425-7CC20	...525-7CC20	...625-7CC20
	32	...132-7CC20	...232-7CC20	...332-7CC20	...432-7CC20	...532-7CC20	...632-7CC20
	40	...140-7CC20	...240-7CC20	...340-7CC20	...440-7CC20	...540-7CC20	...640-7CC20
	50	...150-7CC20	...250-7CC20	...350-7CC20	...450-7CC20	...550-7CC20	...650-7CC20
	63	...163-7CC20	...263-7CC20	...363-7CC20	...463-7CC20	...563-7CC20	...663-7CC20

Ref. No. CB-DE1 30182  
40017-1200-0717/31947

Circuit-breaker IEC 60898  
Test sequence

Type: 5SJ6...8CC20 (..D\*/6 kA)

Number of CB-Test report	Characteristic	Rated current (A)	Number of poles	Testsequence								
				A	B	C	D0	D1	E1	E2	E3	
40017-1200-0717/31947												
-1	D	0.3	1									
-2	D	0.3	1+N				X			X		
-3	D	0.3	2							X		
-4	D	0.3	3+N							X		
-5	D	0.3	4							X		
-6	D	0.5	1							X		
-7	D	1	1				X					
-8	D	1.6	1				X					
-9	D	2	1				X					
-10	D	2.5	1				X					
-11	D	3	1				X					
-12	D	4	1				X					
-13	D	5	1				X					
-14	D	6	1				X					
-15	D	8	1				X					
-16	D	10	1				X					
-17	D	13	1				X					
-18	D	16	1				X					
-19	D	20	1				X					
-20	D	25	1				X					
-21	D	32	1				X					
-22	D	32	1+N				X			X		
-23	D	32	2							X		
-24	D	32	3+N							X		
-25	D	32	4							X		
-26	D	40	1							X		
-27	D	40	1+N				X			X		
-28	D	40	2							X		
-29	D	40	3+N							X		
-30	D	40	4							X		
-31	D	50	1							X		
-32	D	63	1				X					
-33	D	63	1+N	X	X	X	X	X	X	X		
-34	D	63	2				X	X	X	X		
-35	D	63	3+N	X	X	X	X	X	X	X		
-36	D	63	4	X	X	X	X	X	X	X		

## Circuit-breakers 5SJ6... (6kA)

## Type listing

		Type 5SJ6 ...-8CC20 (LS63 V1)					
Pole		1	2	3	4	1+N	3+N
Characteristic/ Rated current		5SJ6...	5SJ6...	5SJ6...	5SJ6...	5SJ6...	5SJ6...
D	0,3	...114-8CC20	...214-8CC20	...314-8CC20	...414-8CC20	...514-8CC20	...614-8CC20
	0,5	...105-8CC20	...205-8CC20	...305-8CC20	...405-8CC20	...505-8CC20	...605-8CC20
	1	...101-8CC20	...201-8CC20	...301-8CC20	...401-8CC20	...501-8CC20	...601-8CC20
	1,6	...115-8CC20	...215-8CC20	...315-8CC20	...415-8CC20	...515-8CC20	...615-8CC20
	2	...102-8CC20	...202-8CC20	...302-8CC20	...402-8CC20	...502-8CC20	...602-8CC20
	2,5	...100-8CC20	...200-8CC20	...300-8CC20	...400-8CC20	...500-8CC20	...600-8CC20
	3	...103-8CC20	...203-8CC20	...303-8CC20	...403-8CC20	...503-8CC20	...603-8CC20
	4	...104-8CC20	...204-8CC20	...304-8CC20	...404-8CC20	...504-8CC20	...604-8CC20
	5	...111-8CC20	...211-8CC20	...311-8CC20	...411-8CC20	...511-8CC20	...611-8CC20
	6	...106-8CC20	...206-8CC20	...306-8CC20	...406-8CC20	...506-8CC20	...606-8CC20
	8	...108-8CC20	...208-8CC20	...308-8CC20	...408-8CC20	...508-8CC20	...608-8CC20
	10	...110-8CC20	...210-8CC20	...310-8CC20	...410-8CC20	...510-8CC20	...610-8CC20
	13	...113-8CC20	...213-8CC20	...313-8CC20	...413-8CC20	...513-8CC20	...613-8CC20
	16	...116-8CC20	...216-8CC20	...316-8CC20	...416-8CC20	...516-8CC20	...616-8CC20
	20	...120-8CC20	...220-8CC20	...320-8CC20	...420-8CC20	...520-8CC20	...620-8CC20
	25	...125-8CC20	...225-8CC20	...325-8CC20	...425-8CC20	...525-8CC20	...625-8CC20
	32	...132-8CC20	...232-8CC20	...332-8CC20	...432-8CC20	...532-8CC20	...632-8CC20
	40	...140-8CC20	...240-8CC20	...340-8CC20	...440-8CC20	...540-8CC20	...640-8CC20
	50	...150-8CC20	...250-8CC20	...350-8CC20	...450-8CC20	...550-8CC20	...650-8CC20
	63	...163-8CC20	...263-8CC20	...363-8CC20	...463-8CC20	...563-8CC20	...663-8CC20

Product Safety GmbH

Ger.-Ausw.-Nr.

Artzeichen

Anlage Nr.

AN 9859812

00143-ZHyy-E9832848E01

1(2/3)

Am Grauen Stein  
D - 51105 Köln

(von der Prüfstelle auszufüllen/ to be filled in by PTG)  
in 2-facher Ausfertigung einzureichen / Please submit in duplicate



TUV Rheinland

Model	Output (KW)	Current (A)	Voltage (V)	Speed (r/min)	Eff. (%)	Power factor	Locked rotor torque / rated torque	locked rotor current / rated current	Break-down torque / Rated torque	IP degree	Insulation class	Serial No
Y132S-6	3	7.3	380	960	63	0.76	2	6.5	2.2	IP 55	F	20226
Y132M1-6	4	9.4	380	980	64	0.77	2	6.5	2.2	IP 55	F	20235
Y132M2-6	5.5	12.6	380	980	65	0.76	2	6.5	2.2	IP 55	F	20715
Y132S-8	2.2	5.9	380	710	61	0.71	2	5.5	2	IP 55	F	20235
Y132M-8	3	7.8	380	710	62	0.72	2	5.5	2	IP 55	F	20748
Y160M1-2	11	21.8	380	2930	67	0.88	2	7	2.3	IP 55	F	20256
Y160M2-2	15	29.4	380	2930	68	0.88	2	7	2.3	IP 55	F	4195
Y160L-2	18.5	35.5	380	2930	69	0.89	2	7	2.2	IP 55	F	4197
Y160M-4	11	22.6	380	1460	68	0.84	2.2	7	2.3	IP 55	F	4198
Y160L-4	15	30.3	380	1460	69	0.85	2.2	7	2.3	IP 55	F	4200
Y160M-6	7.5	17.0	380	970	66	0.75	2	6.5	2	IP 55	F	42212
Y160L-6	11	24.6	380	970	67	0.76	2	6.5	2	IP 55	F	4195
Y160M1-8	4	9.9	380	720	64	0.73	2	6	2	IP 55	F	4204
Y160M2-8	5.5	13.3	380	720	65	0.74	2	6	2	IP 55	F	4206
Y160L-8	7.5	17.7	380	720	66	0.75	2	5.5	2	IP 55	F	4199
Y180M-2	22	42	380	2940	69	0.89	2.2	7	2.2	IP 55	F	5102
Y180M-4	18.5	36	380	1470	69	0.86	2.0	7	2.2	IP 55	F	5104
Y180L-4	22	43	380	1470	69	0.86	2.0	7	2.2	IP 55	F	5106
Y180L-6	15	32	380	970	90	0.81	1.8	6.5	2	IP 55	F	5108
Y180L-8	11	25	380	730	67	0.77	1.7	6	2	IP 55	F	5110
Y200L1-2	30	57	380	2950	90	0.89	2	7	2.2	IP 55	F	5202
Y200L2-2	37	70	380	2950	91	0.89	2	7	2.2	IP 55	F	5204
Y200L-4	30	57	380	1470	92	0.87	2	7	2.2	IP 55	F	5205
Y200L1-6	18.5	38	380	970	90	0.83	1.8	6.5	2	IP 55	F	5206
Y200L2-6	22	45	380	970	90	0.83	1.8	6.5	2	IP 55	F	5210
Y200L-8	15	34	380	730	68	0.76	1.8	6	2	IP 55	F	5212
Y225M-2	45	84	380	2978	92	0.89	2	7	2.2	IP 55	F	4202
Y225S-4	37	70	380	1480	92	0.87	1.9	7	2.2	IP 55	F	4200
Y225M-4	45	84	380	1480	92	0.88	1.9	7	2.2	IP 55	F	4204
Y225M-6	30	60	380	980	90	0.85	1.7	6.5	2	IP 55	F	4201
Y225S-8	18.5	41	380	730	90	0.76	1.7	6	2	IP 55	F	4203
Y225M-8	22	46	380	740	90	0.76	1.8	6	2	IP 55	F	4208
Y250M-2	55	103	380	2970	92	0.89	2	7	2.2	IP 55	F	4302
Y250M-4	55	103	380	1480	93	0.88	2	7	2.2	IP 55	F	4304
Y250M-6	37	72	380	980	91	0.86	1.8	6.5	2	IP 55	F	4306
Y250M-8	30	63	380	740	91	0.8	1.8	6	2	IP 55	F	4308
Y280S-2	75	140	380	2970	92	0.89	2	7	2.2	IP 55	F	4125
Y280M-2	90	166	380	2970	92	0.89	2	7	2.2	IP 55	F	4127
Y280S-4	75	140	380	1480	93	0.88	1.9	7	2.2	IP 55	F	4129

Köln, den 23.12.1998

(Ort / place)

(Datum / date)

Zhang Rao

*Zhang Rao*

25/12/1998

TUV Rheinland  
Product Safety GmbH

(Stempel und Unterschrift des Antragstellers / stamp and signature of applicant)

TUV

of Conformity  
Low Voltage Directive 73/23/EEC  
as last amended by EEC Directive 93/68/EEC

Registration No.: AN 50007463 0001

Report No.: 15000098 001

Holder: WU XI ZHONG DA MOTORS CO., LTD.  
Xinan town outside of south gate  
WUXI JIANGSU 214135  
P.R. CHINA

Product: Motor  
Three-phase single-speed cage induction motor

Identification: Type Designation: Y80 Series - Y315 Series  
Rated Voltage : 220 230V, 380V  
Serial No : N/A (Engineering Sample)

15

Remark: Refer to Appendix 1 for Details

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all revision of Annex I of Council Directive 73/23/EEC, in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV signature mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.



Certification Body

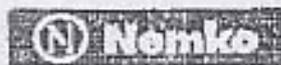


*[Handwritten signature]*  
Date: 15.01.2005

Col. No. 12/01/2005

TUV Fachbereich Elektrotechnik (402) / 15.01.2005

EC Declaration of Conformity (EN 50488) / 15.01.2005



## ATTESTATION OF CONFORMITY

Page 1 of 1

### WITH EUROPEAN DIRECTIVE

Order No. 20003512

A sample of the following product has been tested and is stated by Nemko to be in conformity with the applicable European safety standard referred below

Manufacturer	Jiangsu Jiangsheng Electric Motor Co., Ltd. No. 6 Gongren Road, Huzhou City, Jiangsu CHINA
Product	Industrial motors
Model/type	Y2 series
Data	0,12-315kW 300V 3ac 50Hz
Other specification	2-10 poles, IP54
Standards applied	Safety std. EN 60034-1:04 and IEC 60034-1:04 + A1:05 LV 60034-5:06 and IEC 60034-5:05

Statement reference: 200030152

It may therefore be presumed that the tested sample of this product is in conformity with the technical provisions of the following European Directive including the latest amendments, and with national legislation implementing this Directive:

- Low Voltage Directive 73/23/EEC

On this basis, the manufacturer (or the European authorized representative), may draw up an EC/EEA Declaration of Conformity and affix the CE-marking as indicated below to each conforming product.

Date of issue: 08 January 2005

*Gunnstein A. Strand*  
signature

Gunnstein A. Strand  
Head of section



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E-mail: info@nemko.no

### 1.3 Applicable standard

## Regulations

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2014/35/EU

## Reference Standards

- EN ISO 12100:2010 / Safety of machinery - General principles for design- Risk assessment and risk reduction
- EN 1114-1:2011/ Rubber and Plastic Machines-Extruders and extrusion lines-Part 1 Safety requirements for extruders
- EN 60204-1:2018 Safety of machinery - Electrical equipment of machines - Part 1 : General requirements for industrial electrical device

## **Part II: Assessment of conformity**

2.1 Essential health and safety requirements

2.2 Risk assessment

## 2.1 Essential health and safety requirements

Clause	Requirement – test	Result	Verdict
1	Essential health and safety requirements	–	–
1.1	General remarks	–	–
1.1.1	Definitions	–	–
1.1.2	Principles of safety integration	–	–
a)	Machinery must be designed and constructed so that it is fitted for its function, and can be operated, adjusted and maintained without putting persons at risk when these operations are carried out under the conditions foreseen but also taking into account any reasonably foreseeable misuse thereof.	These specified requirements have been complied with.	<b>Pass</b>
	The aim of measures taken must be to eliminate any risk throughout the foreseeable lifetime of the machinery including the phases of transport, assembly, dismantling, disabling and scrapping.	Appropriate measures have been taken to eliminate or reduce those existed risks.	<b>Pass</b>
b)	In selecting the most appropriate methods, the manufacturer must apply the following principles, in the order given;	–	–
	–Eliminate or reduce risks as far as possible;	The measures have been taken to eliminate or reduce risks as far as possible.	<b>Pass</b>
	– Take the necessary protective measures in relation to risks that can't be eliminated;	Appropriate guards and warning signs are used.	<b>Pass</b>
	– Inform users of the residual risks due to any shortcomings of the protection measures adopted, indicate whether any particular training is required and specify any need to provide personal protection equipment.	The related safety information for the users to operate the machine has been included in the instruction manual.	<b>Pass</b>
c)	When designing and constructing machinery and when drafting the instructions, the manufacturer or his authorised representative must envisage not only the intended use of the machinery but also any reasonably foreseeable misuse thereof.	All safety principles have been taken into account as far as possible during the design of these machines.	<b>Pass</b>
	The machinery must be designed and constructed in such a way as to prevent	These requirements have been complied with, and the related	<b>Pass</b>

Clause	Requirement – test	Result	Verdict
	abnormal use if such use would engender a risk. Where appropriate, the instructions must draw the user's attention to ways – which experience has shown might occur – in which the machinery should not be used.	information also has been provided within the instruction manual.	
d)	Machinery must be designed and constructed to take account of the constraints to which the operator is subject as a result of the necessary or foreseeable use of personal protective equipment.	These requirements have been taken into account during the design of this machine.	Pass
e)	Machinery must be supplied with all the special equipment and accessories essential to enable it to be adjusted, maintained and used safely.	It has been complied with.	Pass
1.1.3	Materials and products	–	–
	The materials used to construct machinery or products used and created during its use must not endanger exposed persons' safety or health	Materials and products cannot endanger exposed person's safety or health.	Pass
	In particular, where fluids are used, machinery must be designed and constructed for use without risks due to filling, use, recovery or draining.	It has been complied with..	Pass
1.1.4	Lighting	–	–
	The manufacturer must supply integral lighting suitable for the operations concerned where its lack is likely to cause a risk despite ambient lighting of normal intensity.	No this situation,	N/A
	Machinery must be designed and constructed so that there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects on moving parts due to the lighting.	No this situation,	N/A
	Internal parts requiring frequent inspection, and adjustment and maintenance areas, must be provided with appropriate lighting.	No this situation,	N/A
1.1.5	Design of machinery to facilitate its	–	–

Clause	Requirement – test	Result	Verdict
	handling		
	Machinery or each component part thereof must:	–	–
	– be capable of being handled and transported safely,	All of them are capable of being handled safely.	Pass
	– be packaged or designed so that it can be stored safely and without damage	The machinery can be stored safely and without damage.	Pass
	During the transportation of the machinery and/or its component parts, there must be no possibility of sudden movements or of hazards due to instability as long as the machinery and/or its component parts are handled in accordance with the instructions.	There are no possibility of sudden movements or of hazards due to instability as long as the machinery and/or its component parts are handled.	Pass
	Where the weight, size or shape of machinery or its various component parts prevents them from being moved by hand, the machinery or each components part must:	–	–
	– Either be fitted with attachments for lifting gear, or	Not applicable.	N/A
	– Be designed so that it can be fitted with such attachments, or	It has been complied with.	Pass
	– Be shaped in such a way that standard lifting gear can easily be attached	Not applicable.	N/A
	Where machinery or one of its component parts is to be moved by hand, it must:	–	–
	– Either be easily movable, or	Not applicable.	N/A
	– Be equipped for picking up and moving in complete safety	Not applicable.	N/A
	Special arrangement must be made for the handling of tools and/or machinery parts, even if lightweight, which could be dangerous.	No this kind of situation.	N/A
1.1.6	Ergonomics	–	–
	Under the intended conditions of use, the discomfort, fatigue and physical and psychological stress faced by the operator must be reduced to the minimum possible, taking into account ergonomic principles such as:	–	–
	– allowing for the variability of the	The requirement has been complied	Pass

Clause	Requirement – test	Result	Verdict
	operator's physical dimensions, strength and stamina,	with.	
	– providing enough space for movements of the parts of the operator's body,	The requirement has been complied with.	Pass
	– avoiding a machine-determined work rate,	The requirement has been complied with.	Pass
	– avoiding monitoring that requires lengthy concentration,	The requirement has been complied with.	Pass
	– adapting the man/machinery interface to the foreseeable characteristics of the operators.	Not applicable.	N/A
1.1.7	Operating positions	–	–
	The operating position must be designed and constructed in such a way as to avoid any risk due to exhaust gases and/or lack of oxygen.	The requirement has been complied with.	Pass
	If the machinery is intended to be used in a hazardous environment presenting risks to the health and safety of the operator or if the machinery itself gives rise to a hazardous environment, adequate means must be provided to ensure that the operator has good working conditions and is protected against any foreseeable hazards.	No this situation.	N/A
	Where appropriate, the operating position must be fitted with an adequate cabin designed, constructed and/or equipped to fulfill the above requirements. The exit must allow rapid evacuation. Moreover, when applicable, an emergency exit must be provided in a direction which is different from the usual exit.	No this situation.	N/A
1.1.8	Seating	–	–
	Where appropriate and where the working conditions so permit, work stations constituting an integral part of the machinery must be designed for the installation of seats.	Not applicable.	N/A
	If the operator is intended to sit during operation and the operating position is an integral part of the machinery, the seat	Not applicable.	N/A

Clause	Requirement – test	Result	Verdict
	must be provided with the machinery.		
	The operator's seat must enable him to maintain a stable position. Furthermore, the seat and its distance from the control devices must be capable of being adapted to the operator.	Not applicable.	N/A
	If the machinery is subject to vibrations, the seat must be designed and constructed in such a way as to reduce the vibrations transmitted to the operator to the lowest level that is reasonably possible. The seat mountings must withstand all stresses to which they can be subjected. Where there is no floor beneath the feet of the operator, footrests covered with a slip-resistant material must be provided.	Not applicable.	N/A
1.2	CONTROL SYSTEMS	–	–
1.2.1	Safety and reliability of control systems	–	–
	Control systems must be designed and constructed so that they are safe and reliable, in a way that will prevent a dangerous situation arising.	All related safe and reliable technologies have been used adequately for these machines.	Pass
	Above all they must be designed and constructed:	–	–
	– They can withstand the rigors of normal use and external influences	The whole control system can withstand the rigors of normal use and external factors.	Pass
	– a fault in the hardware or the software of the control system does not lead to hazardous situations,	The requirement has been complied with.	Pass
	– Errors in control system logic don't lead to dangerous situations	Errors in logic don't lead to dangerous situations.	Pass
	– reasonably foreseeable human error during operation does not lead to hazardous situations.	The requirement has been complied with.	Pass
	Particular attention must be given to the following points:	–	–
	– the machinery must not start unexpectedly,	The machinery cannot start unexpectedly.	Pass
	– the parameters of the machinery must not change in an uncontrolled way, where	The requirement has been complied with.	Pass

Clause	Requirement – test	Result	Verdict
	such change may lead to hazardous situations,		
	– the machinery must not be prevented from stopping if the stop command has already been given,	The machinery cannot be prevented from stopping when the stop command has already been given.	Pass
	– no moving part of the machinery or piece held by the machinery must fall or be ejected,	no moving part of the machinery or piece held by the machinery must fall or be ejected,	Pass
	– automatic or manual stopping of the moving parts, whatever they may be, must be unimpeded,	The requirement has been complied with.	Pass
	– the protective devices must remain fully effective or give a stop command,	remain fully effective.	Pass
	– the safety-related parts of the control system must apply in a coherent way to the whole of an assembly of machinery and/or partly completed machinery.	The requirement has been complied with.	Pass
	For cable-less control, an automatic stop must be activated when correct control signals are not received, including loss of communication.	Not applicable.	N/A
1.2.2	Control devices	–	–
	Control devices must be:	–	–
	– clearly visible and identifiable, using pictograms where appropriate,	It has been complied with.	Pass
	– positioned in such a way as to be safely operated without hesitation or loss of time and without ambiguity,	Suitable position for each control device has been taken.	Pass
	– Designed so that the movement of the control is consistent with its effect	The movement of the control is consistent with its effect.	Pass
	– located outside the danger zones, except where necessary for certain control devices such as an emergency stop or a teach pendant,	They are located outside the danger zones.	Pass
	– Positioned so that their operation can't cause additional risk	Suitable position for each control device has been taken.	Pass
	– designed or protected in such a way that the desired effect, where a hazard is involved, can only be achieved by a deliberate action,	No this situation.	N/A
	– made in such a way as to withstand foreseeable forces; particular attention	All of them can withstand foreseeable strain.	Pass

Clause	Requirement – test	Result	Verdict
	must be paid to emergency stop devices liable to be subjected to considerable forces.		
	Where a control is designed and constructed to perform several different actions, namely where there is no one-to-one correspondence, the action to be performed must be clearly displayed and subject to confirmation where necessary.	No this situation,	N/A
	Controls devices must be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles	All control devices have been arranged adequately and taking account of ergonomic principles.	Pass
	Constraints due to the necessary foreseeable use of personal protection equipment must be taken into account	Not applicable.	N/A
	Machinery must be fitted with indicators as required for safe operation	This requirement has been complied with.	Pass
	The operator must be able to read them from the control position	They can be read from the control position.	Pass
	From each control position, the operator must be able to ensure that no-one is in the danger zones, or the control system must be designed and constructed in such a way that starting is prevented while someone is in the danger zone.	The operator can be able to ensure the no-one is in the danger zones from the control position.	Pass
	If neither of these possibilities is applicable, before the machinery starts, an acoustic and/or visual warning signal must be given. The exposed persons must have time to leave the danger zone or prevent the machinery starting up.	Not applicable.	N/A
	If necessary, means must be provided to ensure that the machinery can be controlled only from control positions located in one or more predetermined zones or locations.	The requirement has been complied with.	Pass
	Where there is more than one control position, the control system must be designed in such a way that the	No this situation.	N/A

Clause	Requirement – test	Result	Verdict
	use of one of them precludes the use of the others, except for stop controls and emergency stops.		
	When machinery has two or more operating positions, each position must be provided with all the required control devices without the operators hindering or putting each other into a hazardous situation.	No this situation.	N/A
1.2.3	Starting	–	–
	It must be possible to start machinery only by voluntary actuation of a control provided for the purpose	These machines shall be started only by voluntary actuation of a control.	Pass
	The same requirement applies:	–	–
	– When restarting the machinery after stoppage, whatever the cause	The same requirement is applied.	Pass
	– When effecting a significant change in the operating conditions	The same requirement is applied.	Pass
	However, the restarting of the machinery or a change in operating conditions may be effected by voluntary actuation of a device other than the control device provided for the purpose, on condition that this does not lead to a hazardous situation.	Not applicable.	N/A
	For machinery functioning in automatic mode, the starting of the machinery, restarting after a stoppage, or a change in operating conditions may be possible without intervention, provided this does not lead to a hazardous situation.	Not applicable.	N/A
	Where machinery has several starting control devices and the operators can therefore put each other in danger, additional devices must be fitted to rule out such risks. If safety requires that starting and/or stopping must be performed in a specific sequence, there must be devices which ensure that these operations are performed in the correct order.	Not applicable.	N/A
1.2.4	Stopping	–	–

Clause	Requirement – test	Result	Verdict
1.2.4.1	Normal stopping	–	–
	Each machine must be fitted with a control whereby the machine can be brought safely to a complete stop	The normal stopping devices have been used for these machines.	Pass
	Each workstation must be fitted with a control to stop some or all of the moving parts of the machinery, depending on the type of hazard, so that the machinery is rendered safe	Workstation has fitted with a normal stopping device.	Pass
	The machinery’s stop control must have priority over the start controls	They have priority over the start controls.	Pass
	Once the machinery or its dangerous parts have stopped, the energy supply to the actuators concerned must be cut off	The energy supply has been cut off after the machine is stopped.	Pass
1.2.4.2	Operational stop	–	–
	Where, for operational reasons, a stop control that does not cut off the energy supply to the actuators is required, the stop condition must be monitored and maintained.	No this situation.	N/A
1.2.4.3	Emergency stop	–	–
	machinery must be fitted with one or more emergency stop devices to enable actual or impending danger to be averted	The requirement has been complied with.	Pass
	The following exceptions apply:	–	–
	– Machines in which an emergency stop device would not lessen the risk, either because it would not reduce the stopping time or because it would not enable the special measures required to deal with the risk to be taken	Not applicable.	N/A
	– Hand-held portable machines and hand-guided machines	Not applicable.	N/A
	The emergency stop device must:	–	–
	– Have clearly identifiable, clearly visible and quickly accessible controls	The requirement has been complied with.	Pass
	– Stop the dangerous process as quickly as possible, without creating additional hazards	The requirement has been complied with.	Pass
	– Where necessary, trigger or permit the triggering of certain safeguard movements	No this kind of application	N/A
	Once active operation of the emergency	Not applicable.	N/A

Clause	Requirement – test	Result	Verdict
	stop control has ceased following a stop command, that command must be sustained by engagement of the emergency stop device until that engagement is specifically overridden		
	It must be possible to disengage the device only by an appropriate operation, and disengaging the device must not restart the machinery but only permit restarting	The requirement has been complied with.	Pass
	The emergency stop function must be available and operational at all times, regardless of the operating mode.	The requirement has been complied with.	Pass
	Emergency stop devices must be a back-up to other safeguarding measures and not a substitute for them.	The requirement has been complied with.	Pass
1.2.4.4	Complex installations	–	–
	In the case of machinery or parts of machinery designed to work together, must so design and construct the machinery that the stop controls, including the emergency stop, can stop not only the machinery itself but also all equipment upstream and/or downstream if its continued operation can be dangerous	No this situation.	N/A
1.2.5	Mode selection	–	–
	The control mode selected must override all other control systems with the exception of the emergency stop	These specified requirements have been complied with.	Pass
	If machinery has been designed and built to allow for its use in several control or operating modes presenting different safety levels, it must be fitted with a mode selector which can be locked in each position	Not applicable.	N/A
	Each position of the selector must correspond to a single operating or control mode	Each of them is corresponding to a single operating or control mode.	Pass
	The selector may be replaced by another selection method which restricts the use of certain functions of the machinery to certain categories of operator	No this kind of application.	N/A

Clause	Requirement – test	Result	Verdict
	If, for certain operations, the machinery must be able to operate with its protection devices neutralized, the mode selector must simultaneously:	No this kind of application.	N/A
	— disable all other control or operating modes,	Not applicable.	N/A
	– Permit movements only by controls requiring sustained action	Not applicable.	N/A
	– Permit the operation of dangerous moving parts only in enhanced safety conditions while preventing hazards from linked sequences	Not applicable.	N/A
	– Prevent any movement liable to pose a danger by acting voluntarily or involuntarily on the machine’s internal sensors	Not applicable.	N/A
	If these four conditions cannot be fulfilled simultaneously, the control or operating mode selector must activate other protective measures designed and constructed to ensure a safe intervention zone.	Not applicable.	N/A
	In addition, the operator must be able to control operation of the parts he is working on at the adjustment point.	Not applicable.	N/A
1.2.6	Failure of the power supply	–	–
	The interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply to the machinery must not lead to a dangerous situation	No risk is generated from these accidental situations.	Pass
	In particular:	–	–
	– The machinery must not start unexpectedly	It doesn’t start unexpectedly.	Pass
	— the parameters of the machinery must not change in an uncontrolled way when such change can lead to hazardous situations,	the parameters of the machinery will not change in an uncontrolled way	Pass
	– The machinery must not be prevented from stopping if the command has already been given	This requirement has been complied with.	Pass
	– No moving part of the machinery or piece held by the machinery must fall or	This clause has been met.	Pass

Clause	Requirement – test	Result	Verdict
	be ejected		
	– Automatic or manual stopping of the moving parts whatever they must be unimpeded	This requirement has been complied with.	<b>Pass</b>
	– The protection devices must remain fully effective	All protection devices can remain effective fully.	<b>Pass</b>
1.3	Protection against mechanical hazards	–	–
1.3.1	Risk of loss of stability	–	–
	Machinery, components and fittings thereof must be so designed and constructed that they are stable enough, under the foreseen operating conditions for use without risk of overturning, falling or unexpected movement	The stability of machines, components and fittings has been taken into consideration.	<b>Pass</b>
	If the shape of the machinery itself or its intended installation doesn't offer sufficient stability, appropriate means of anchorage must be incorporated and indicated in the instructions	Not applicable.	<b>N/A</b>
1.3.2	Risk of break-up during operation	–	–
	The various parts of machinery and their linkages must be able to withstand the stress to which they are subject when used as foreseen by the manufacturer	All parts used can withstand sufficient stress for working.	<b>Pass</b>
	The durability of the materials used must be adequate for the nature of the workplace foreseen by the manufacturer, in particular as regards the phenomena of fatigue, aging, corrosion and abrasion	All materials used have adequate durability.	<b>Pass</b>
	The manufacturer must indicate in the instructions the type and frequency of inspection and maintenance required for safety reasons, where appropriate, indicate the parts subject to wear and the criteria for replacement	This information in relation to inspection and maintenance etc. are indicated in the instruction manual.	<b>Pass</b>
	Where a risk of rupture or disintegration remains despite the measures taken the moving parts must be mounted and positioned in such a way that in case of rupture their fragments will be contained	No this kind of situation.	<b>N/A</b>
	Both rigid and flexible pipes carrying fluids, particularly those under high	No this kind of situation.	<b>N/A</b>

Clause	Requirement – test	Result	Verdict
	pressure, must be able to withstand the foreseen internal and external stresses and must be firmly attached and/or protected against all manner of external stresses and strains; precaution must be taken to ensure that no risk is posed by a rupture		
	Where the material to be processed is fed to the tool automatically, the following conditions must be fulfilled to avoid risks to the persons exposed:	–	–
	– When the work piece comes into contact with the tool the later must have attained its normal working conditions	This requirement has been complied with.	Pass
	– When the tool starts and/or stops the feed movement and the tool movement must be coordinated	This requirement has been complied with.	Pass
1.3.3	Risks due to falling or ejected objects	–	–
	Precautions must be taken to prevent risks from falling or ejected objects	This requirement has been complied with.	Pass
1.3.4	Risks due to surfaces, edges or angles	–	–
	In so far as their purpose allows, accessible parts of the machinery must have no sharp edges, no sharp angles, and no rough surfaces likely to cause injury	All parts have been processed carefully so that they have no sharp edges, no sharp angles, and no rough surfaces likely to cause injury.	Pass
1.3.5	Risks related to combined machinery	–	–
	Where the machinery is intended to carry out several different operations with the manual removal of the piece between each operation, it must be designed and constructed in such a way as to enable each element to be used separately without the other elements constituting a danger or risk for the exposed person	No this situation.	N/A
	For this purpose, it must be possible to start and stop separately and elements that are not protected	Not applicable.	N/A
1.3.6	Risks relating to variations in operating conditions	–	–
	Where the machinery persforms operations under different conditions of	The machinery can be operated safely and reliably under different	Pass

Clause	Requirement – test	Result	Verdict
	use, it must be designed and constructed in such a way that selection and adjustment of these conditions can be carried out safely and reliably	conditions of use.	
1.3.7	Prevention of risks related to moving parts	–	–
	The moving parts of machinery must be designed, built and laid out to avoid hazards or, where hazards persist, fixed with guards or protective devices in such a way as to prevent all risk of contact which could lead to accidents	Appropriate protective guards have been fitted to avoid hazards.	Pass
	All necessary steps must be taken to prevent accidental blockage of moving parts involved in the work	Appropriate protective guards have been taken to avoid hazards.	Pass
	In cases where, despite the precautions taken, a blockage is likely to occur, specific protection devices or tools, the instruction handbook and possibly a sign on the machinery should be provided by the manufacturer to enable the equipment to be safely unblocked	No this kind of risk situation.	N/A
	The instructions and, where possible, a sign on the machinery shall identify these specific protective devices and how they are to be used.	Not applicable.	N/A
1.3.8	Choice of protection against risks arising from moving parts	–	–
	Guards or protection devices used to protect against the risks related to moving parts must be selected on the basis of the type of risk	Guards or protection devices have been used appropriately.	Pass
	The following guidelines must be used to help make the choice	–	–
1.3.8.1	Moving transmission parts	–	–
	Guards designed to protect exposed persons against the risks associated with moving transmission parts must be:	–	–
	– Either fixed, complying with requirements 1.4.1 and 1.4.2.1 or	The fixed guards are used.	Pass
	— interlocking movable guards as referred to in section 1.4.2.2.	No this kind of situation.	N/A

Clause	Requirement – test	Result	Verdict
	Interlocking movable guards should be used where frequent access is envisaged.	No this situation.	N/A
1.3.8.2	Moving parts involved in the process	–	–
	guards or protection devices designed to protect exposed persons against the risks associated with moving parts contributing to the work must be:	–	–
	– either fixed guards complying with requirements 1.4.1 and 1.4.2.1	fixed guards complying with requirements 1.4.1 and 1.4.2.1	Pass
	– interlocking movable guards as referred to in section 1.4.2.2, or	No this situation.	N/A
	– protective devices as referred to in section 1.4.3, or	No this situation.	N/A
	– a combination of the above.	No this situation.	N/A
	However, when certain moving parts directly involved in the process can't be made completely or partially inaccessible during operation owing to operations requiring near-by operator intervention, where technically possible such parts must be fitted with:	–	–
	– fixed guards or interlocking movable guards preventing access to those sections of the parts that are not used in the work, and	Not applicable.	N/A
	– adjustable guards as referred to in section 1.4.2.3 restricting access to those sections of the moving parts where access is necessary.	Not applicable.	N/A
1.3.9	Risks of uncontrolled movements	–	–
	When a part of the machinery has been stopped, any drift away from the stopping position, for whatever reason other than action on the control devices, must be prevented or must be such that it does not present a hazard.	The requirement has been complied with.	Pass
1.4	Required characteristics of guards and protection devices	–	–
1.4.1	General requirement	–	–
	Guards and protection devices must:	–	–
	– Be of robust construction	They are of robust construction.	Pass
	– be securely held in place,	be securely held in place,	Pass

Clause	Requirement – test	Result	Verdict
	– Not give rise to any additional risk	No additional risk is generated.	Pass
	– Not be easy to bypass or render non-operational	They cannot be easy to bypass or render non-operational.	Pass
	– Be located at an adequate distance from the danger zone	Appropriate safety distances according to EN ISO13857 has been complied with.	Pass
	– Cause minimum obstruction to the view of the production process	This requirement has been complied with.	Pass
	— enable essential work to be carried out on the installation and/or replacement of tools and for maintenance purposes by restricting access exclusively to the area where the work has to be done, if possible without the guard having to be removed or the protective device having to be disabled.	These requirements have been taken into account during the design of the protection devices.	Pass
	In addition, guards must, where possible, protect against the ejection or falling of materials or objects and against emissions generated by the machinery.	No this situation.	N/A
1.4.2	Special requirements for guards	–	–
1.4.2.1	Fixed guards	–	–
	Fixed guards must be fixed by systems that can be opened or removed only with tools.	They are held securely in place.	Pass
	Their fixing systems must remain attached to the guards or to the machinery when the guards are removed.	They can be opened only with tools.	Pass
	Where possible, guards must be unable to remain in place without their fixings	Guards are unable to remain in place without their fixings	Pass
1.4.2.2	Interlocking movable guards	–	–
	Interlocking movable guards must:	–	–
	– As far as possible remain fixed to the machinery when open	Not applicable.	N/A
	— be designed and constructed in such a way that they can be adjusted only by means of an intentional action.	Not applicable.	N/A
	Interlocking movable guards must be associated with an interlocking device that:	–	–
	— prevents the start of hazardous machinery functions until they are closed	This kind of situation doesn't exist.	N/A

Clause	Requirement – test	Result	Verdict
	and		
	— gives a stop command whenever they are no longer closed.	This kind of situation doesn't exist.	N/A
	Where it is possible for an operator to reach the danger zone before the risk due to the hazardous machinery functions has ceased, movable guards must be associated with a guard locking device in addition to an interlocking device that:	This kind of situation doesn't exist.	N/A
	– prevents the start of hazardous machinery functions until the guard is closed and locked, and	This kind of situation doesn't exist.	N/A
	– keeps the guard closed and locked until the risk of injury from the hazardous machinery functions has ceased.	This kind of situation doesn't exist.	N/A
	Interlocking movable guards must be designed in such a way that the absence or failure of one of their components prevents starting or stops the hazardous machinery functions.	This kind of situation doesn't exist.	N/A
1.4.2.3	Adjustable guards restricting access	–	–
	Adjustable guards restricting access to those areas of the moving parts strictly necessary for the work must:	No adjustable guard has been used.	N/A
	– Be adjustable manually or automatically according to the type of work involved	Not applicable.	N/A
	– Be readily adjustable without the use of tools	Not applicable.	N/A
1.4.3	Special requirements for protection devices	–	–
	Protection devices must be designed and incorporated into the control system so that:	–	–
	– Moving parts can't start up while they are within the operator's reach	Not applicable.	N/A
	– persons cannot reach moving parts while the parts are moving, and	Not applicable.	N/A
	– The absence or failure of one of their components prevents starting or stops the moving parts	Not applicable.	N/A
	Protective devices must be adjustable only by means of an intentional action.	Not applicable.	N/A

Clause	Requirement – test	Result	Verdict
1.5	Protection against other hazards	–	–
1.5.1	Electricity supply	–	–
	Where machinery has an electricity supply it must be designed, constructed and equipped so that all hazards of an electrical nature are or can be prevented	Appropriate protections have been taken.	<b>Pass</b>
	The safety objectives set out in Directive 2006/95/EC shall apply to machinery. However, the obligations concerning conformity assessment and the placing on the market and/or putting into service of machinery with regard to electrical hazards are governed solely by this Directive.	This requirement has been complied with.	<b>Pass</b>
1.5.2	Static electricity	–	–
	Machinery must be so designed and constructed as to prevent or limit the build-up of potentially dangerous electrostatic charges and/or be fitted with a discharging system	Adequate safety design for this requirement has been taken.	<b>Pass</b>
1.5.3	Energy supply other than electricity	–	–
	Where machinery is powered by an energy other than electricity, it must be so designed, constructed and equipped as to avoid all potential hazards associated with these types of energy	This situation doesn't exist.	<b>N/A</b>
1.5.4	Errors of fitting	–	–
	Errors likely to be made when fitting or refitting certain parts which could be a source of risk must be made impossible by the design of such parts or, failing this, by information on moving parts and/or their housings where the direction of movement must be known to avoid a risk	Appropriate design has been taken during design and attention has been paid during fitting.	<b>Pass</b>
	Where necessary, the instructions must give further information on these risks.	Adequate instructions are given in the instruction manual.	<b>Pass</b>
	Where a faulty connection can be the source of risk, incorrect connections must be made impossible by design or, failing this, by information given on the elements to be connected and, where appropriate,	The relative safety technologies have been taken and sufficient information has been given.	<b>Pass</b>

Clause	Requirement – test	Result	Verdict
	on the means of connection.		
1.5.5	Extreme temperatures	–	–
	Step must be taken to eliminate any risk of injury caused by contact with or proximity to machinery parts or materials at high or very low temperatures	This kind of situation doesn't exist.	N/A
	The necessary steps must also be taken to avoid or protect against the risk of hot or very cold material being ejected.	This kind of situation doesn't exist.	N/A
1.5.6	Fire	–	–
	Machinery must be designed and constructed to avoid all risk of fire or overheating posed by the machinery itself or by gases, liquids, dusts, vapors or the other substances produced or used by the machinery	Not applicable.	N/A
1.5.7	Explosion	–	–
	Machinery must be designed and constructed to avoid any risk of explosion posed by the machinery itself or by gases, liquids, dusts, vapors or other substances produced or used by the machinery	No explosion risk is generated.	N/A
	Machinery must comply, as far as the risk of explosion due to its use in a potentially explosive atmosphere is concerned, with the provisions of the specific Community Directives.	No explosion risk is generated.	N/A
1.5.8	Noise	–	–
	Machinery must be so designed and constructed that risks resulting from the emission of airborne noise are reduced to the lowest level taking accounting of technical progress and the availability of means of reducing noise, in particular at source	Appropriate measure has been taken.	Pass
	The level of noise emission may be assessed with reference to comparative emission data for similar machinery.	–	–
1.5.9	Vibration	–	–
	Machinery must be so designed and constructed that risks resulting from vibrations produced by the machinery are	Not applicable.	N/A

Clause	Requirement – test	Result	Verdict
	reduced to the lowest level, taking account of technical progress and the availability of means of reducing vibration, in particular at source		
	The level of vibration emission may be assessed with reference to comparative emission data for similar machinery.	–	–
1.5.10	Radiation	–	–
	Undesirable radiation emissions from the machinery must be eliminated or be reduced to levels that do not have adverse effects on persons.	No harmful emission of radiation has been found.	N/A
	Any functional ionising radiation emissions must be limited to the lowest level which is sufficient for the proper functioning of the machinery during setting, operation and cleaning. Where a risk exists, the necessary protective measures must be taken.	No harmful emission of radiation has been found.	N/A
	Any functional non-ionising radiation emissions during setting, operation and cleaning must be limited to levels that do not have adverse effects on persons.	No harmful emission of radiation has been found.	N/A
1.5.11	External radiation	–	–
	Machinery must be so designed and constructed that external radiation doesn't interfere with its operation	Not applicable.	N/A
1.5.12	Laser equipment	–	–
	Where laser equipment is used, the following provisions should be taken into account;	No laser equipment is used.	N/A
	– Laser equipment on machinery must be designed and constructed so as to prevent any accidental radiation	No laser equipment is used.	N/A
	– Laser equipment on machinery must be protected so that effective radiation, radiation produced by reflection or diffusion and secondary radiation don't damage health	No laser equipment is used.	N/A
	– Optical equipment for the observation or adjustment of laser equipment on machinery must be such that no health	No laser equipment is used.	N/A

Clause	Requirement – test	Result	Verdict
	risk is created by the laser rays		
1.5.13	Emissions of hazardous materials and substances	–	–
	Machinery must be so designed, constructed and/or equipped that risks due to gases, liquids, dust, vapors and other waste materials which it produces can be avoided	It has been complied with.	Pass
	Where a hazard cannot be eliminated, the machinery must be so equipped that hazardous materials and substances can be contained, evacuated, precipitated by water spraying, filtered or treated by another equally effective method.	No this kind of hazard exists.	N/A
	Where the process is not totally enclosed during normal operation of the machinery, the devices for containment and/or evacuation must be situated in such a way as to have the maximum effect.	Not applicable.	N/A
1.5.14	Risk of being trapped in a machine	–	–
	Machinery must be so designed, constructed or fitted with a means of preventing a exposed person from being enclosed within it or, if that is impossible, with a means of summoning help	No this situation.	N/A
1.5.15	Risk of slipping, tripping or falling	–	–
	Parts of the machinery where persons are liable to move about or stand must be designed and constructed to prevent persons slipping, tripping or falling on or off these parts	No this situation.	N/A
	Where appropriate, these parts must be fitted with handholds that are fixed relative to the user and that enable them to maintain their stability.	No this situation.	N/A
1.5.16	Lightning	–	–
	Machinery in need of protection against the effects of lightning while being used must be fitted with a system for conducting the resultant electrical charge to earth.	Not applicable.	N/A
1.6	Maintenance	–	–

Clause	Requirement – test	Result	Verdict
1.6.1	Machinery maintenance	–	–
	Adjustment and maintenance points must be located outside danger zones.	They are located outside danger zones.	Pass
	It must be possible to carry out adjustment, maintenance, repair, cleaning and servicing operations while machinery is at a standstill	These jobs can be carried out while the machine is at a standstill.	Pass
	If one or more of the above conditions can't be satisfied for technical reasons, these operations must be possible without risk	Not applicable.	N/A
	In the case of automated machinery and, where necessary, other machinery, the manufacturer must take provision for a connecting device for mounting diagnostic fault-finding equipment	The requirement has been complied with.	Pass
	Automated machine components which have to be changed frequently, in particular for a change in manufacture or where they are liable to wear or likely to deteriorate following an accident, must be capable of being removed and replaced easily and in safety	The relative components can be removed and replaced easily and in safety.	Pass
	Access to the components must enable these tasks to be carried out with the necessary technical means in accordance with an operating method specified by the manufacturer	Appropriate means have been given in the instruction manual.	Pass
1.6.2	Access to operating position and servicing points	–	–
	Machinery must be designed and constructed in such a way as to allow access in safety to all areas where intervention is necessary during operation, adjustment and maintenance of the machinery.	Appropriate protection measures have been taken so that all areas can be accessed safely.	Pass
1.6.3	Isolation of energy sources	–	–
	All machinery must be fitted with means to isolate it from all energy sources	Circuit breaker has been taken into used.	Pass
	Such isolators must be clearly identified	They are identified clearly.	Pass
	They must be capable of being locked if reconnection could endanger exposed	Not applicable.	N/A

Clause	Requirement – test	Result	Verdict
	persons		
	The isolator must be capable of being locked also where an operator is unable, from any of the points to which he has access, to check that the energy is still cut off	Not applicable.	N/A
	In the case of machinery supplied with electricity through a plug capable of being plugged into a circuit, separation of the plug is sufficient	Not applicable.	N/A
	After the energy is cut off, it must be possible to dissipate normally any energy remaining or stored in the circuits of the machinery without risk to exposed persons	This requirement has been complied with.	Pass
	As an exception to the above requirements, certain circuits may remain connected to their energy source in order, for example, to hold parts, protect information, light interiors, etc. In this case, special steps must be taken to ensure operator safety	This kind of situation doesn't exist.	N/A
1.6.4	Operator intervention	–	–
	Machinery must be so designed, constructed and equipped that the need for operator intervention is limited	The operator intervention has been limited.	Pass
	If operator intervention can't be avoided, it must be possible to carry it out easily and in safety	The requirement has been complied with.	Pass
1.6.5	Cleaning of internal parts	–	–
	The machinery must be designed and constructed in such a way that it is possible to clean internal parts which have contained dangerous substances or preparations without entering them; any necessary unblocking must also be possible from the outside	No this situation.	N/A
	If it is absolutely impossible to avoid entering the machinery, the manufacturer must take steps during its construction to allow cleaning to take place safely.	No this situation.	Pass
1.7	INFORMATION	–	–
1.7.1	Information and warnings on the	–	–

Clause	Requirement – test	Result	Verdict
	machinery		
	Information and warnings on the machinery should preferably be provided in the form of readily understandable symbols or pictograms.	Information and warnings are readily understandable pictograms.	Pass
	Any written or verbal information and warnings must be expressed in an official Community language or languages, which may be determined in accordance with the Treaty by the Member State in which the machinery is placed on the market and/or put into service and may be accompanied, on request, by versions in any other official Community language or languages understood by the operators.	The requirement has been complied with.	Pass
1.7.1.1	Information and information devices	–	–
	The information needed to control machinery must be provided in a form that is unambiguous and easily understood. It must not be excessive to the extent of overloading the operator.	Be unambiguous and easily understood.	Pass
	Visual display units or any other interactive means of communication between the operator and the machine must be easily understood and easy to use.	Not applicable.	N/A
1.7.1.2	Warning devices	–	–
	Where the health and safety of persons may be endangered by a fault in the operation of unsupervised machinery, the machinery must be equipped in such a way as to give an appropriate acoustic or light signal as a warning.	It has been complied with.	Pass
	Where machinery is equipped with warning devices these must be unambiguous and easily perceived. The operator must have facilities to check the operation of such warning devices at all times.	Be unambiguous and easily understood.	Pass
	The requirements of the specific Community Directives concerning colors and safety signals must be complied with	It has been complied with.	Pass
1.7.2	Warning of residual risks	–	–

Clause	Requirement – test	Result	Verdict
	Where risks remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted, the necessary warnings, including warning devices, must be provided.	Appropriate warning has been taken.	Pass
1.7.3	Marking	–	–
	All machinery must be marked legibly and indelibly with the following minimum particular:	–	–
	– the business name and full address of the manufacturer and, where applicable, his authorised representative,	It has been marked.	Pass
	– designation of the machinery,	It has been marked.	Pass
	– the CE Marking (see Annex III),	It has been marked.	Pass
	– designation of series or type,	It has been marked.	Pass
	– serial number, if any,	It has been marked.	N/A
	– the year of construction, that is the year in which the manufacturing process is completed.	This information has been provided.	Pass
	It is prohibited to pre-date or post-date the machinery when affixing the CE marking.	This information has been provided.	Pass
	Furthermore, machinery designed and constructed for use in a potentially explosive atmosphere must be marked accordingly.	No this situation.	N/A
	Machinery must also bear full information relevant to its type and essential for safe use. Such information is subject to the requirements set out in section 1.7.1.	The requirement has been complied with.	Pass
	Where a machine part must be handled during use with lifting equipment, its mass must be indicated legibly, indelibly and unambiguously.	The mass of the machinery has been marked.	Pass
1.7.4	Instructions	–	–
	All machinery must be accompanied by instructions in the official Community language or languages of the Member State in which it is placed on the market and/or put into service.	The language of the instructions is english.	Pass

Clause	Requirement – test	Result	Verdict
	The instructions accompanying the machinery must be either 'Original instructions' or a 'Translation of the original instructions', in which case the translation must be accompanied by the original instructions.	It has been included in the instructions.	Pass
	By way of exception, the maintenance instructions intended for use by specialised personnel mandated by the manufacturer or his authorised representative may be supplied in only one Community language which the specialised personnel understand.	It has been included in the instructions.	Pass
	The instructions must be drafted in accordance with the principles set out below.	It has been included in the instructions.	Pass
1.7.4.1	General principles for the drafting of instructions	–	–
	a) The instructions must be drafted in one or more official Community languages. The words 'Original instructions' must appear on the language version(s) verified by the manufacturer or his authorised representative.	In english.	Pass
	(b) Where no 'Original instructions' exist in the official language(s) of the country where the machinery is to be used, a translation into that/those language(s) must be provided by the manufacturer or his authorized representative or by the person bringing the machinery into the language area in question. The translations must bear the words 'Translation of the original instructions'.	Not applicable.	N/A
	(c) The contents of the instructions must cover not only the intended use of the machinery but also take into account any reasonably foreseeable misuse thereof.	It is included in the instructions.	Pass
	(d) In the case of machinery intended for use by non-professional operators, the wording and layout of the instructions for use must take into account the level of	The requirement has been complied with.	Pass

Clause	Requirement – test	Result	Verdict
	general education and acumen that can reasonably be expected from such operators.		
1.7.4.2	Contents of the instructions	–	–
	Each instruction manual must contain, where applicable, at least the following information:	–	–
	a) the business name and full address of the manufacturer and of his authorised representative;	it is included.	Pass
	b) the designation of the machinery as marked on the machinery itself, except for the serial number (see section 1.7.3);	it is included.	Pass
	(c) the EC declaration of conformity, or a document setting out the contents of the EC declaration of conformity, showing the particulars of the machinery, not necessarily including the serial number and the signature;	it is included.	Pass
	(d) a general description of the machinery;	it is included.	Pass
	(e) the drawings, diagrams, descriptions and explanations necessary for the use, maintenance and repair of the machinery and for checking its correct functioning;	it is included.	Pass
	(f) a description of the workstation(s) likely to be occupied by operators;	it is included.	Pass
	(g) a description of the intended use of the machinery;	it is included.	Pass
	(h) warnings concerning ways in which the machinery must not be used that experience has shown might occur;	it is included.	Pass
	(i) assembly, installation and connection instructions, including drawings, diagrams and the means of attachment and the designation of the chassis or installation on which the machinery is to be mounted;	it is included.	Pass
	(j) instructions relating to installation and assembly for reducing noise or vibration;	not applicable.	N/A
	(k) instructions for the putting into service and use of the machinery and, if	it is included.	Pass

Clause	Requirement – test	Result	Verdict
	necessary, instructions for the training of operators;		
	(l) information about the residual risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted;	it is included.	Pass
	(m) instructions on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided;	Not applicable.	N/A
	(n) the essential characteristics of tools which may be fitted to the machinery;	It has been included in the instructions.	Pass
	(o) the conditions in which the machinery meets the requirement of stability during use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns;	It has been included in the instructions.	Pass
	(p) instructions with a view to ensuring that transport, handling and storage operations can be made safely, giving the mass of the machinery and of its various parts where these are regularly to be transported separately;	It is included in the instructions.	Pass
	(q) the operating method to be followed in the event of accident or breakdown; if a blockage is likely to occur, the operating method to be followed so as to enable the equipment to be safely unblocked;	Not applicable.	N/A
	(r) the description of the adjustment and maintenance operations that should be carried out by the user and the preventive maintenance measures that should be observed;	It has been included in the instructions.	Pass
	(s) instructions designed to enable adjustment and maintenance to be carried out safely, including the protective measures that should be taken during these operations;	Use the language of the country in which the machinery is to be used	Pass
	(t) the specifications of the spare parts to be used, when these affect the health and safety of operators;	It has been complied with.	Pass

Clause	Requirement – test	Result	Verdict
	(u) the following information on airborne noise emissions:	–	–
	– Equivalent continuous A-weighted pressure level at workstations, where this exceeds 70 dB (A); where this level doesn't exceed 70 dB (A), this fact must be indicated	See the instruction manual in detail	Pass
	– Peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 uPa)	Not applicable.	N/A
	– Sound power level emitted by the machinery where the equivalent continuous A-weight sound pressure level at workstations exceeds 80 dB (A)	Not applicable.	N/A
	These values must be either those actually measured for the machinery in question or those established on the basis of measurements taken for technically comparable machinery which is representative of the machinery to be produced.	The requirement has been complied with.	Pass
	In the case of very large machinery, instead of the A-weighted sound power level, the A-weighted emission sound pressure levels at specified positions around the machinery may be indicated.	Not applicable.	N/A
	Where the harmonized standards are not applied, sound levels must be measured using the most appropriate method for the machinery	Not applicable.	N/A
	Whenever sound emission values are indicated the uncertainties surrounding these values must be specified. The operating conditions of the machinery during measurement and the measuring methods used must be described.	See the instruction manual in detail.	Pass
	Where the workstation(s) are undefined or cannot be defined, A-weighted sound pressure levels must be measured at a distance of 1 metre from the surface of	The workstation(s) are defined.	Pass

Clause	Requirement – test	Result	Verdict
	the machinery and at a height of 1,6 metres from the floor or access platform.		
	The position and value of the maximum sound pressure must be indicated	See the instruction manual in details.	<b>Pass</b>
	Where specific Community Directives lay down other requirements for the measurement of sound pressure levels or sound power levels, those Directives must be applied and the corresponding provisions of this section shall not apply;	No this situation.	<b>N/A</b>
	(v) where machinery is likely to emit non-ionising radiation which may cause harm to persons, in particular persons with active or non-active implantable medical devices, information concerning the radiation emitted for the operator and exposed persons.	The machine will not be used in a potentially explosive atmosphere.	<b>N/A</b>
1.7.4.3	Sales literature	–	–
	Sales literature describing the machinery must not contradict the instructions as regards health and safety aspects. Sales literature describing the performance characteristics of machinery must contain the same information on emissions as is contained in the instructions.	The requirement has been complied with.	<b>Pass</b>

## 2.2 Risk assessment

## 1. Introduction.

In general this risk assessment report for the **Plastic Sheet&Plate&Film Extrusion Line**, model **JWZN80** and its variants made by **Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd.** was carried out in accordance with the requirements of Machinery Directive and the standards of EN ISO 12100–2010.

After the first assessment, some measures to eliminate the risks are given for the modification of machine or of relative documents with taking into account the explicit C-type EN standard or related B-type standard.

While taking appropriate provisions for the existing risks, the procedures and principles to eliminate the risk according to the most general B-type standard for any kind of machine, EN ISO 12100–2010, are followed, i.e.:

- First step: consider the possibility of eliminating risk at design stage.
- Second step: if impossible, protect the dangerous zone with appropriate design of safety guard or safety device.
- Third step: If above impossible, give warning signs to draw attention of operators about the residual risks.

In addition, some check list drawn from the explicit C-type EN standards, which are found suitable for or near the characteristic of this machine, are used to help developing the provisions for the elimination of the risks.

Finally the risk assessment was carried out again to ensure this machine and its relative documents are totally compliance with the Machinery Directive.

2. Risk assessment and risk reduction

Risk assessment and risk reduction					
Machine		Plastic Sheet&Plate&Film Extrusion Line		Analyst	Alex
Sources		Specifications, preliminary design		Extent	Use phase: setting and operation
Method		Checklists: EN ISO 12100: 2010 Annex B		Date	March 29, 2023
No.	Type of group	Hazards		Risk reduction Protective measures	
		origin	Potential consequences		
1	Mechanical hazards	Rotating rolls or parts expose to the air	Drawing-in of fingers or hands	Warning signs and guards have been used	
		Working near the drills	stabbing or puncture	Guards have been used	
		Parts eject or liquid leaks that have high energy	High fluid or part is spurting to the operator	Warning signs have been used	
		units are moving close to each other	Impacting and crushing	Guards have been used	
2	Electrical hazards	Parts become live under fault.	Gets shock by contacting with the live parts.	Electrical equipment in accordance with IEC 60204-1.	
3	Thermal hazards	Hot surfaces expose in the air.	Gets burned or scalded when contact with Hot surfaces	waring signs and devices have been used.	
4	Radiation hazards	ultra-violet radiation	The operator exposes in the area of the radiation leak	reasonable precautions have been used	
5	Noise hazards	The working noise is too aloud to the operator	permanent hearing loss and tinnitus	Measures have been used	

### **Part III: Test report**

3.1 EN 1114-1 test report

3.2 EN 60204-1 test report

3.3 Airborne noise test report

### 3.1 EN 1114-1 test report

**Test Report Content**

This test report consists of:  
\*Main report

**General information:**

The test results presented in this report relate only to the object tested and information given from applicant or manufacturer.

**Test case verdicts:**

Pass=Pass, Fail=Fail, N/A=Not applicable. Placed in the column marked "Verdict".

This is a Computer generated Test Report.

×Information written in "Italic" or "Italic and bold" font style is written by project Engineer during testing.

All other information in "Regular" or "Regular and bold" font style is a part of this "Test Report Form".

**CONTENT FOR ADDITIONAL INFORMATION**

Clause	Requirement - test	Result	Verdict
<b>0</b>	<b>Introduction</b>	-	-
<b>1</b>	<b>Scope</b>	-	-
<b>2</b>	<b>Normative references</b>	-	-
<b>3</b>	<b>Definitions</b>	-	-
<b>4</b>	<b>List of significant hazards</b>	-	-
<b>4.1.</b>	<b>General</b>	-	-
	This clause contains all the significant hazards, hazardous situations and events, as	It has been complied with.	<b>Pass</b>

	far as they are dealt with in this document, identified by risk assessment as significant for this type of machinery and which require action to eliminate or reduce the risk.		
<b>4.2</b>	<b>Mechanical hazards</b>	-	-
	NOTE Table 1 below shows the danger areas and the types of mechanical hazards which may occur and gives reference to the corresponding safety requirements and/or protective measures in 5.2.	It has been complied with.	<b>Pass</b>
<b>4.3</b>	<b>Hazards due to electrical energy</b>	No this situation	<b>N/A</b>
	-Electrical shock or burns due for example to direct or indirect contact with live parts;	Warning sign has been taken.	<b>Pass</b>
	-electrical shock due to electrostatic phenomena.	Warning sign has been taken.	<b>Pass</b>
<b>4.4</b>	<b>Thermal hazards</b>	-	-
	-Burns,	Warning sign has been taken.	<b>Pass</b>
	-scalds,	No this situation	<b>N/A</b>
	due to contact with hot machine parts, hot extruded product, hot gases or hot liquids.	No this situation	<b>N/A</b>
<b>4.5</b>	<b>Hazards generated by noise</b>	No this situation	<b>N/A</b>
	-Hearing loss:	-	-
	- interference with speech communication;	No this situation	<b>N/A</b>
	- interference with the perception of acoustic signals, due to high noise levels.	No this situation	<b>N/A</b>
<b>4.6</b>	<b>Hazards resulting from materials and substances processed, used and/or exhausted by the machinery</b>	-	-
	Contact with, or inhalation of, materials, fumes or gases escaping from the openings.	No this situation	<b>N/A</b>
<b>4.7</b>	Fire hazards	-	-
	Ignition due to	-	-
	-contact with flammable materials;	Suitable protection measure has been taken.	<b>Pass</b>
	-leaks from hydraulic lines on to hot surfaces.	Suitable protection measure has been taken.	<b>Pass</b>
<b>4.8</b>	<b>Hazards due to falling from height</b>	-	-
	Injury due to falling from high level working places.	No this situation	<b>N/A</b>
<b>4.9</b>	<b>Hazards due to unsuitable ergonomics</b>	-	-
<b>5</b>	<b>Safety requirements and/or measures</b>	-	-
<b>5.1</b>	<b>General</b>	-	-
	Machinery shall comply with the safety requirements and/or protective measures of this clause.	It has been complied with the safety requirements and protective measures of this clause..	<b>Pass</b>
	In addition, the machine shall be designed according to the principles of EN ISO 12100 for relevant but not significant hazards which are not dealt with by this document.	It has been complied with.	<b>Pass</b>
<b>5.2</b>	<b>Mechanical hazards</b>	-	-
<b>5.2.1</b>	<b>Drive and power transmission</b>	-	-
	The drive shafts and couplings between the motor and reduction gear and transmission	It is exist in this machine, and suitable protection measure has	<b>Pass</b>

	belts shall be protected by fixed guards in accordance with EN 953:1997+A1:2009. For safety distances of EN ISO 13857:2008, Tables 2, 3 and/or 4 apply.	been taken.	
<b>5.2.2</b>	<b>screw shaft</b>	-	-
	If the end of the screw shaft is not enclosed by a housing, it shall be protected by fixed guards in accordance with EN 953:1997+A1:2009. For safety distances of EN ISO 13857:2008, Tables 2, 3 and/or 4 apply.	The end of the screw shaft is enclosed by a housing.	<b>Pass</b>
<b>5.2.3</b>	<b>Openings in the barrel</b>		
<b>5.2.3.1</b>	<b>Main feed opening-with or without a feeding system</b>	-	-
	The main feed opening shall be protected:	-	-
	- by design, taking into account the safety distances in accordance with EN ISO 13857:2008, Tables 2, 3 and/or 4; or	No this situation	<b>N/A</b>
	- by the presence of a fixed or interlocked feeding system, for example hoppers or crammer feed systems. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849-1:2008, PLr =C.	An interlocked feeding system is used.	<b>Pass</b>
<b>5.2.3.2</b>	<b>Secondary openings</b>	-	-
	Secondary feed opening not under pressure shall be protected in accordance with 5.2.3.1.	No this situation	<b>N/A</b>
	Secondary feed openings which are pressurized shall be protected in accordance with 5.2.3.3	No this situation	<b>N/A</b>
<b>5.2.3.3</b>	<b>Opening for the attachment of accessories</b>	-	-
	Openings for the attachment of accessories shall be protected by the presence of the accessories or by using fixed plugs; see also 7.2 b).	No this situation	<b>N/A</b>
<b>5.2.4</b>	<b>Feed systems</b>	-	-
<b>5.2.4.1</b>	<b>hopper</b>	-	-
	Access to dangerous movement shall be prevented by design, taking into consideration the safety distances in accordance with EN ISO 13857:2008, Tables 2, 3 and/or 4.	-	-
	If the hopper is provided with a door or movable cover which permits access to the dangerous movements, that door or cover, shall be provided with an interlocking device as defined in EN ISO 12100:2010, 3.28.1. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849-1:2008, PLr =C.	An interlocked device is used.	<b>Pass</b>
<b>5.2.4.2</b>	<b>Single roller feed</b>	-	-
	The intake area of the single roller feed shall be protected:	-	-
	- by design, taking into account the safety distances in accordance with EN ISO	No this situation	<b>N/A</b>

	13857:2008, Tables 2, 3 and/or 4; or		
	- by a fixed hopper or another fixed guard in accordance with EN 953:1997+A1:2009.	No this situation	<b>N/A</b>
	If the single roller feed is opened, the movement of the screw(s) and the roller shall be stopped by an interlocking device as defined in EN ISO 12100:2010, 3.28.1. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849-1:2008, PLr =c.	No this situation	<b>N/A</b>
	If the opening and closing of the feed roller is motorized, the danger points shall be protected	No this situation	<b>N/A</b>
	If the opening and closing of the feed roller is motorised, the danger points shall be protec	No this situation	<b>N/A</b>
	- by an interlocking guard in accordance with EN 953:1997+A1:2009. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849-1:2008, PLr =c; or	No this situation	<b>N/A</b>
	by a hold-to-run control device as defined in EN ISO 12100:2010, 3.28.3, which is positioned so that the danger area is visible to the operator and at a sufficient distance to prevent the operator being endangered by the opening and closing of the roller housing. The safety related parts of the control system implementing the hold-to-run control function shall be in accordance with EN ISO 13849-1:2008, PLr =c.	No this situation	<b>N/A</b>
	If it is necessary for certain operations to rotate the screw(s) or the feed roller with the feed system open, a two hand control device in accordance with EN 574:1996+A1:2008, type II shall be provided if they are not protected by design. This two hand control device shall be located in the immediate vicinity of the feed roller. Fixed guards in accordance with EN 953:1997+A1:2009 or equivalent protective devices shall be fitted where this is necessary to prevent the access of a second person to the danger area.	No this situation	<b>N/A</b>
	If it is necessary for certain operations to rotate the screw(s) or the feed roller with the feed system open, a two hand control device in accordance with EN 574:1996+A1:2008, type II shall be provided if they are not protected by design. This two hand control device shall be located in the immediate vicinity of the feed roller. Fixed guards in accordance with EN 953:1997+A1:2009 or equivalent protective devices shall be fitted where this is necessary to prevent the access of a second person to the danger area.	No this situation	<b>N/A</b>

<b>5.1.4.3</b>	<b>Double roller feed</b>	-	-
	The intake area of the feed rollers shall be protected:	-	-
	- by design, taking into account the safety distances in accordance with EN ISO 13857:2008, Tables 2, 3 and/or 4; or	It has been complied with.	<b>Pass</b>
	- by a fixed hopper or a fixed guard in accordance with EN 953:1997+A1:2009.	Not applicable.	<b>N/A</b>
	If the double roller feed is opened, for example by swinging away the feed hopper, the movement of the rollers shall be stopped by an interlocking device as defined in EN ISO 12100:2010, 3.28.1. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849- 1:2008, PLr =c.	It has been complied with.	<b>Pass</b>
	If it is necessary for certain operations (e.g. in laboratories) to rotate the rollers with the feeding system open a two hand control device in accordance with EN 574:1996+A1:2008, type II shall be provided. This two hand control device shall be positioned in the immediate vicinity of the rollers. Fixed guards in accordance with EN 953:1997+A1:2009 or equivalent protective devices shall be fitted where this is necessary to prevent access of a second person to the danger area.	It has been complied with.	<b>Pass</b>
	If the double roller feed can be swivelled away or dismantled, the opening shall be safeguarded in accordance with 5.2.3.1.	No this situation	<b>N/A</b>
	The double roller feed shall be provided with an emergency stop in accordance with EN ISO 13850:2008, stop category '0' or stop category '1' so that movement of the extruder screw and the feed rollers can be stop	It has been complied with.	<b>Pass</b>
	The double roller feeding system shall be provided with a stopping device conforming to stop category 0 or stop category I of EN ISO 13850. so that movement of the extruder screw and the feed rollers can be halted.	A emergency stopping device has been provided.	<b>Pass</b>
<b>5.2.4.4</b>	<b>Crammer feed</b>	-	-
	Danger areas of crammer feeders shall be protected:	-	-
	-by design	No this situation	<b>N/A</b>
	- by fixed guards in accordance with EN 953:1997+A1:2009; or	No this situation	<b>N/A</b>
	- by interlocking guards in accordance with EN 953:1997+A1:2009. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849-1:2008, PLr =c.	No this situation	<b>N/A</b>
	In all these cases the safety distances shall be in accordance with EN ISO 13857:2008, Tables 2, 3 and/or 4.	No this situation	<b>N/A</b>

<b>5.2.5</b>	<b>Excess pressure protection</b>	-	-
	The extruder and the parts subject to excess pressure shall be protected against exceeding the maximum admissible internal pressure indicated by the manufacturer by one or more of the following measures:	-	-
	-safety breaking points	No this situation	<b>N/A</b>
	-bursting discs	No this situation	<b>N/A</b>
	- pressure sensing system in accordance with EN ISO 13849-1:2008, PLr =c which, where a limit value is reached, switches off all the pressure generating elements via the control system;	A limit value is reached.	<b>Pass</b>
	-expanding bolts	No this situation	<b>N/A</b>
	position sensing system in accordance with EN ISO 13849-1:2008, PLr =c for the recording of the backward displacement of an overhanging positioned extruder screw(s) which, where a limit value is reached, switches off all the pressure generating elements via the control system.	It has been complied with.	<b>Pass</b>
	Number and position of such elements or systems shall be defined according to the composition of the extruder or the extrusion line.	They have been defined according to the composition of the extruder or the extrusion line.	<b>Pass</b>
	An alarm shall be provided in case of fault or failure of the specific control system intended for the reduction of dangerous overpressure.	An alarm has been provided.	<b>Pass</b>
	Possible ejection of material or parts used for the means of over pressure protection (e.g. safety breaking points, bursting discs, expanding bolts) shall be directed safely, e.g. downwards or deflected safely by design for example by the use of deflector panels.	These have been directed safely.	<b>Pass</b>
<b>5.2.6</b>	<b>Screen changer</b>	-	-
<b>5.2.6.1</b>	<b>General</b>	-	-
	Screen changers shall be protected against hazardous movement and against splashing from hot extruded material.	Screen changers are safely protected	<b>Pass</b>
<b>5.2.6.2</b>	<b>Automatic screen changer</b>	-	-
	Automatic screen changers shall be protected by interlocking guards in accordance with EN 953:1997+A1:2009. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849-1:2008, PLr =c.	-	-
<b>5.2.6.3</b>	<b>Manual screen changer</b>	-	-
	Manual screen changers are to be protected by design in such a way that in case of an unintended splashing of material it will be diverted safely, for example, by using deflector panels. The safety distances shall be in accordance with EN ISO 13857:2008, Tables 2, 3 and/or 4.	Manual screen changers are protected by design.	<b>Pass</b>
<b>5.2.7</b>	<b>Melt/gear pump</b>	-	-
	Melt/gear pumps shall be protected against	Fixed guards are used.	<b>Pass</b>

	hazards arising from rotating parts of the drive by fixed guards in accordance with EN 953:1997+A1:2009 by taking into consideration the safety distances of EN ISO 13857:2008, Tables 2, 3 and/or 4 and against exceeding the maximum admissible internal pressure as defined by the manufacturer in accordance with 5.2.5.		
<b>5.2.8</b>	<b>Melt pipes and adaptors</b>	-	-
	Melt pipes and adaptors shall be designed to withstand maximum internal pressures as generated by the application in accordance with 5.2.5.	Melt pipes can withstand maximum internal pressures.	<b>Pass</b>
<b>5.2.9</b>	<b>Static mixer</b>	-	-
	Static mixers shall be protected against exceeding the maximum internal pressure as defined by the manufacturer in accordance with 5.2.5.	Static mixers are protected against exceeding the maximum internal pressure.	<b>Pass</b>
<b>5.2.10</b>	<b>Extruder head</b>	-	-
	Extruder heads and/or its parts shall be protected against mechanical hazards due to dangerous movements, if existing:	-	-
	- by design taking into account the safety distances in accordance with EN ISO 13857:2008, Table 2 for reaching over protective structures; or	No this situation.	<b>N/A</b>
	- by fixed guards in accordance with EN 953:1997+A1:2009; or	Fixed guards are used.	<b>Pass</b>
	- by interlocking guards in accordance with EN 953:1997+A1:2009. The safety related parts of the control system implementing the interlocking function shall be in accordance with EN ISO 13849-1:2008, PLr =c.	No this situation	<b>N/A</b>
	If access is necessary to areas subject to dangerous movements, the dangerous movements may only be initiated by:	-	-
	-a two-hand control device conforming type III of EN 574, which should be located in the immediate vicinity of the extruder head to give the operator a clear view of the danger area; or	No this situation	<b>N/A</b>
	- a hold-to-run control device as defined in EN ISO 12100:2010, 3.28.3, located at a minimum distance of 2 m from the danger area. The safety related parts of the control system implementing the hold-to-run control function shall be in accordance with EN ISO 13849-1:2008, PLr =b.	No this situation	<b>N/A</b>
	Fixed guards or equivalent protective devices shall be fitted where this is necessary to prevent the access of a second person to the danger area. The parts of the extruder head shall be capable of being secured when open in order to prevent any dangerous movement caused by gravity-fall or a malfunction of the hydraulic, pneumatic or	No this situation	<b>N/A</b>

	electric control circuits.		
<b>5.2.11</b>	<b>Power operated horizontal movement of the complete machine or parts of it</b>	-	-
	If the machine is so designed that the operator cannot see all parts of the complete machine, an automatically operated acoustic and/or optical signalling device shall be provided giving warning of imminent movement of the machine.	acoustic and optical signalling device is provided.	<b>Pass</b>
	To prevent crushing of the feet the carriage wheels shall be provided with fixed guards in accordance with EN 953:1997+A1:2009 taking into account the maximum safety distance of 15 mm specified in EN ISO 13857:2008, Table 7.	fixed guards are used.	<b>Pass</b>
	Where the maximum speed of movement of the machine exceeds 100 mm/s, a sensitive protective equipment (trip device) as defined in EN ISO 12100:2010, 3.28.5 shall be provided in the direction of movement to ensure that the machine stops safely taking into account the overrun. If this sensitive protective equipment (trip device) cannot be fitted to the moving part, a hold-to-run control device as defined in EN ISO 12100:2010, 3.28.3 shall be provided allowing only movement of the machine at a maximum speed of 100 mm/s. The safety related parts of the control system implementing the interlocking function and the holdto- run-control function shall be in accordance with EN ISO 13849-1:2008, PLr =c.	Not this situation.	<b>N/A</b>
	Unintended movement of the machine shall be prevented. This can be achieved for example by a braking system. To prevent unintended start-up see EN 1037:1995+A1:2008.	A braking system is used.	<b>Pass</b>
	If the machine is fitted with an operating platform on which an operator can stand, the workplace shall be arranged in accordance with EN 349:1993+A1:2008 in such a way as to preclude any crushing hazards caused by fixed or movable adjacent parts. If these safety distances cannot be achieved the movement of the carriage shall be prevented by the use of a sensitive protective equipment (trip device) as defined in EN ISO 12100:2010, 3.28.5.	Not this situation.	<b>N/A</b>
<b>5.3</b>	<b>Electrical energy</b>	-	-
<b>5.3.1</b>	<b>General</b>	-	-
	The electrical equipment shall be in accordance with EN 60204-1:2006+A1:2009 with the exception of connection and junction boxes in the area of the heating zones, where protection to IP 3X of EN 60529:1991 is sufficient. This deviates from EN 60204-1:2006+A1:2009, 11.3. In addition, the specific requirements given in 5.3.2 to 5.3.4 apply.	The electrical equipment is in accordance with EN 60204-1:2006+A1:2009.	<b>Pass</b>

	Specification for emergency stop and the stop categories to be chosen are given in 5.2.4.2, 5.2.4.3 and 5.10.	-	-
<b>5.3.2</b>	<b>Supply disconnecting (isolating) device</b>	-	-
	The supply disconnecting devices shall be in accordance with EN 60204-1:2006+A1:2009, 5.3.2 and 5.3.3.	It has been complied with.	<b>Pass</b>
<b>5.3.3</b>	<b>Protection against direct contact</b>	-	-
	Protection against direct contact shall be in accordance with EN 60204-1:2006+A1:2009, 6.2.	Protection against direct contact is in accordance with EN 60204-1:2006+A1:2009, 6.2.	<b>Pass</b>
<b>5.3.4</b>	<b>Protection against indirect contact</b>	-	-
	Protection against indirect contact shall be in accordance with EN 60204-1:2006+A1:2009, 6.3.	Protection against direct contact is in accordance with EN 60204-1:2006+A1:2009, 6.3.	<b>Pass</b>
<b>5.3.5</b>	<b>Electrostatic phenomena</b>	-	-
	The areas of the machine where an unwanted build-up of electrostatic charge is foreseeable shall be equipped with protective anti-static equipment. For guidance see CLC/TR 50404:2003.	Protective anti-static equipment is equipped.	<b>Pass</b>
<b>5.4</b>	<b>Thermal hazards</b>	-	-
<b>5.4.1</b>	<b>Hot machine parts</b>	-	-
	Hot machine parts, except for those which cannot be covered for operational or process reasons, e.g. extruder heads, shall be protected against accidental contact by using insulating material or impeding devices in accordance with EN ISO 12100:2010, 3.29; for temperature limit values see EN ISO 13732-1:2008. Warning signs shall be provided on or close to uncovered hot machine parts; see 7.1 a). Information and recommendation about the wearing of personal protective equipment shall be given in the instruction manual; see 7.2 g).	Insulating material is used.	<b>Pass</b>
<b>5.4.2</b>	<b>Hot extruded products, hot gases and hot liquids</b>	-	-
	Warning signs shall be provided on or close to uncovered openings to warn about hot extruded products, hot gases and hot liquids; see 7.1 b). Information and recommendation about the wearing of personal protective equipment shall be given in the instruction manual; see 7.2 h).	<i>Warning signs are used.</i>	<b>Pass</b>
<b>5.5</b>	<b>Noise</b>	-	-
<b>5.5.1</b>	<b>General</b>	-	-
	Machinery shall be so designed and constructed that risks resulting from the emission of airborne noise are reduced to the lowest level, taking account of technical progress and the availability of means of reducing noise, in particular at source. Useful guidance is given in EN ISO 11688-1:2009.	The emission of airborne noise are reduced to the lowest level.	<b>N/A</b>
<b>5.5.2</b>	<b>Noise reduction at source by design</b>	-	-

	Particular attention should be given to the following major sources of noise:	-	-
	- motor drives;	Attention is given.	<b>Pass</b>
	- power transmission systems;	Attention is given.	<b>Pass</b>
	- pneumatic systems;	Attention is given.	<b>Pass</b>
	- pressure relieving/exhaust systems;	Attention is given.	<b>Pass</b>
	- ventilation systems;	Attention is given.	<b>Pass</b>
	- hydraulic pumping equipment;	Attention is given.	<b>Pass</b>
	- control valves;	Attention is given.	<b>Pass</b>
	- pipelines.	Attention is given.	<b>Pass</b>
	The following measures may be taken for noise suppression:	Attention is given.	<b>Pass</b>
	- designs which reduce noise;	Attention is given.	<b>Pass</b>
	- enclosures;	Attention is given.	<b>Pass</b>
	- silencers;	No this situation	<b>N/A</b>
	- low noise emission pumps;	Attention is given.	<b>Pass</b>
	- damping;	No this situation	<b>N/A</b>
	- anti-vibration mountings.	No this situation	<b>N/A</b>
<b>5.5.3</b>	<b>Information connected with noise hazards</b>	-	-
	See 7.2 i) and Annex A.	It has been complied with the requirement.	<b>Pass</b>
<b>5.6</b>	<b>Materials and substances processed, used and/or exhausted by the machinery</b>		
	The extruder shall be designed to allow an exhaust ventilation system to be connected to it; see 7.2 j).	An exhaust ventilation system is connected to it	<b>Pass</b>
<b>5.7</b>	<b>Fire hazards</b>	-	-
	Fire hazards due to overheating of materials shall be limited by heating system temperature monitoring and control.	Fire hazards due to overheating of materials is limited by heating system temperature monitoring and control.	<b>Pass</b>
	Hydraulic systems and components shall be in accordance with EN ISO 4413:2010.	It has been complied with the requirement.	<b>Pass</b>
	Recommendation shall be given in the instruction manual that the machine is to be kept clean; see 7.2 m).	Recommendation has been given in the instruction manual.	<b>Pass</b>
<b>5.8</b>	<b>High level working places</b>	-	-
	Designated access and working positions on the machine shall be designed in accordance with 6.3.5.6 of EN ISO 12100:2010 and with EN ISO 14122-1:2001 and EN ISO 14122-1:2001/A1:2010, EN ISO 14122- 2:2001 and EN ISO 14122-2:2001/A1:2010, EN ISO 14122-3:2001 and EN ISO 14122-3:2001/A1:2010, and and EN ISO 14122-4:2004+A1:2010. Guard-rails shall however be installed only when the height of the possible fall exceeds 1 m.	Not this situation	<b>N/A</b>
<b>5.9</b>	<b>Ergonomics</b>	-	-
	Machine operator working area shall be designed and constructed in accordance with ergonomic requirements, described in EN 614-1:2006+A1:2008; see 7.2 n).	It has been complied with.	<b>Pass</b>

<b>5.10</b>	<b>Emergency stop</b>	-	-
	Emergency stop shall be in accordance with EN ISO 13850:2008, stop category '0' or '1'. At least one emergency stop actuator shall be provided at the control panel, and where necessary according to the risk assessment, at further positions.	Emergency stop is in accordance with EN ISO 13850:2008.	<b>Pass</b>
	All dangerous movements shall be stopped when emergency stop is activated. It is however not mandatory to stop the circulation of heat transport fluids in cooling systems, exhaust systems and heating systems.	All dangerous movements will be stopped when emergency stop is activated	<b>Pass</b>
	Specific requirements for emergency stop are also given in 5.2.4.2 and 5.2.4.3.	-	-
<b>6</b>	<b>Verification of compliance with the safety requirements and/or measures</b>	-	-
	The extruder must be marked visibly, legibly and indelibly with the following minimum particulars:	It has been complied with.	<b>Pass</b>
	"Functional testing" includes verifying the function and efficiency of the guards and protective devices on the basis of descriptions given in the information for use, safety related pThe extruder must be marked visibly, legibly and indelibly with the following minimum particulars: ans and circuit diagrams, the requirements given in Clause 5 of this standard and the other quoted standards.	It has been complied with.	<b>Pass</b>
	"Design validation" means verifying that the design meets the safety specifications of this European standard.	It has been complied with.	<b>Pass</b>
<b>7</b>	<b>Information for users</b>	-	-
<b>7.1</b>	<b>Minimum marking on the machine</b>	-	-
	The extruder must be marked visibly, legibly and indelibly with the following minimum particulars:	-	-
	-business name and full address of the manufacturer and, where applicable, his authorised representative,	Marked visibly.	<b>Pass</b>
	-designation of the machinery,	Marked visibly.	<b>Pass</b>
	-CE Marking,	Marked visibly.	<b>Pass</b>
	designation of series or type,	Marked visibly.	<b>Pass</b>
	-serial number, if any,	Marked visibly.	<b>Pass</b>
	-year of construction, that is the year in which the manufacturing process is completed.	Marked visibly.	<b>Pass</b>
	In addition, indications shall be marked in case of the following hazards:	Marked visibly.	<b>Pass</b>
	a) hot machine parts if their surface temperature exceeds the limit values in EN ISO 13732-1:2008 and if they cannot be protected against inadvertent contact by means of insulating material or additional guards;	Marked visibly.	<b>Pass</b>
	b) hot extruded products, hot gases and hot liquids on or close to uncovered openings;	Marked visibly.	<b>Pass</b>

	c) hot materials which can be released at certain locations e.g. at screen changers, shear heads and extruder heads.	Marked visibly.	<b>Pass</b>
	If required such indications must also include additional information about commissioning, operation, maintenance, cleaning and the requirements to wear personal protective equipment, for instance during screen changing operations, etc.	Marked visibly.	<b>Pass</b>
<b>7.2</b>	<b>Instruction manual</b>	-	-
	Instruction manuals shall be drafted in accordance with EN ISO 12100:2010, 6.4.5.	It has been complied with the requirement.	<b>Pass</b>
	Each machine shall be accompanied by an instruction manual which includes the minimum information as in 7.1, in addition to the fundamental instructions in accordance with EN ISO 12100:2010, 6.4.5.1.	It has been complied with the requirement.	<b>Pass</b>
	In addition, the instruction manual shall include:	-	-
	a) indications about the various operations during work carried out at the openings of the extruder barrel, e.g. instructions for the operators, wearing of personal protection devices, warnings against residual risks, etc.;	It has been listed in the instruction manual.	<b>Pass</b>
	b) Indications to the user that openings for accessories, etc., shall be protected either by the accessory itself or by fixed guards provided;	It has been listed in the instruction manual.	<b>Pass</b>
	c) indications about permissible internal pressures of extruder and ancillary equipment, e.g. melt/gear pumps, melt duct, static mixers, screen changers, shear head and extruder head;	It has been listed in the instruction manual.	<b>Pass</b>
	d) indications that the user shall not open the machine while it is under pressure	It has been listed in the instruction manual.	<b>Pass</b>
	e) indications about the protective measures to be taken during screen changing, e. g. the use of personal protective equipment, etc.;	It has been listed in the instruction manual.	<b>Pass</b>
	f) indications about movement of the entire machine: 1) indications about the spaces needed between the moving parts of the machine and parts of the building or other machines to ensure that no one can be crushed between them (see EN 349:1993+A1:2008); 2) indications, for example by the posting of prohibition signs, not to step up on the moving machine;	It has been listed in the instruction manual.	<b>Pass</b>
	g) instructions about safety measures to be taken against accidental contact with hot machine parts or hot materials if the surface	It has been listed in the instruction manual.	<b>Pass</b>

	temperature exceeds the limit values in EN ISO 13732-1:2008;		
	h) instructions about safety measures to be taken against accidental contact with hot extruded products, hot gases and hot liquids, for example, wearing of personal protective equipment such as protection gloves or protection goggles;	It has been listed in the instruction manual.	<b>Pass</b>
	i) the following information concerning noise:	It has been listed in the instruction manual.	<b>Pass</b>
	1) a noise emission declaration according to A.6; 2) if applicable, information on possible noise enclosures, screens or silencers fitted to the machinery, etc; 3) if applicable, recommendations to use cabins and/or operating and maintenance modes with reduced noise emission, specification about installation and assembly for reducing noise, e.g. vibration dampers; 4) if applicable, recommendation to use personal hearing protection;	It has been listed in the instruction manual.	<b>Pass</b>
	j) where it is known that gases, fumes and dust, hazardous to health can be released, the manufacturer shall recommend the use of exhaust ventilation systems and provide instructions about the locations and connections on the machine;	It has been listed in the instruction manual.	<b>Pass</b>
	k) for maintenance operations on the degassing equipment, the manufacturer shall inform the user that during unscrewing of the degassing dome or of the connection lines (depending on the materials used), hazards due to release of vapours or gases which are hazardous to health can exist, as well as hazards due to contact with health hazardous condensate being released from the lines. For such operations, protective measures shall be mentioned, for example the use of specially trained personnel, the wearing of protective gloves and glasses, etc.;	It has been listed in the instruction manual.	<b>Pass</b>
	l) in particular cases the risks of explosion shall be indicated, e.g. where pentane is used as a blowing agent;	It has been listed in the instruction manual.	<b>Pass</b>
	m) recommendation that the machine is to be kept clean to prevent fire hazards where overheated material may release;	It has been listed in the instruction manual.	<b>Pass</b>
	n) information and recommendation how to operate the machine in order to reduce or to prevent discomfort, fatigue and physical and psychological stress.	It has been listed in the instruction manual.	<b>Pass</b>

## 3.2 EN 60204-1 test report

## Test Report Content

This test report consists of:

Main report

### **General information:**

The test results presented in this report relate only to the object tested and information given from applicant or manufacturer.

Test case verdicts:

Pass = Pass, Fail = Fail, N.A. = Not applicable. Placed in the column marked "Verdict".

This is a Computer generated Test Report.

× Information written in "Italic" or "Italic and bold" font style is written by project Engineer during testing.

All other information in "Regular" or "Regular and bold" font style is a part of this "Test Report Form".

**CONTENT FOR ADDITIONAL INFORMATION**

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>4</b>	<b>General requirements</b>	-	-
<b>4.1</b>	<b>General</b>	-	-
	This standard specifies requirements for the electrical equipment of machines.	Equipment of the machine comply with this standard	Pass
	<p>The risks associated with the hazards relevant to the electrical equipment shall be assessed as part of the overall requirements for risk assessment of the machine. This will:</p> <ul style="list-style-type: none"> <li>– identify the need for risk reduction; and</li> <li>– determine adequate risk reductions; and</li> <li>– determine the necessary protective measures.</li> </ul> <p>For persons who can be exposed to those hazards, while still maintaining an appropriate performance of the machine and its equipment.</p>	<p>The risks associated with the electrical equipment have been taken into consideration during the risk assessment by manufacture.</p> <p>See risk assessment report.</p>	Pass
	<p>Hazardous situations can result from, but are not limited to, the following causes:</p> <ul style="list-style-type: none"> <li>– failures or faults in the electrical equipment resulting in the possibility of electric shock, arc, or fire;</li> <li>– failures or faults in control circuits (or components and devices associated with those circuits) resulting in the malfunctioning of the machine;</li> <li>– disturbances or disruptions in power sources as well as failures or faults in the power circuits resulting in the malfunctioning of the machine;</li> <li>– loss of continuity of circuits that can result in a failure of a safety function, for example those that depend on sliding or rolling contacts;</li> <li>– electrical disturbances for example,</li> </ul>	<p>All the hazards have been taken into account.</p> <p>See risk assessment report.</p>	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<p>electromagnetic, electrostatic either from outside the electrical equipment or internally generated, resulting in the malfunctioning of the machine;</p> <ul style="list-style-type: none"> <li>– release of stored energy (either electrical or mechanical) resulting in, for example, electric shock, unexpected movement that can cause injury;</li> <li>– acoustic noise and mechanical vibration at levels that cause health problems to persons;</li> <li>– surface temperatures that can cause injury.</li> </ul>		
	Safety measures are a combination of the measures incorporated at the design stage and those measures required to be implemented by the user.	Those measures required to be implemented by the user has been instructed in instruction manual.	Pass
	The design and development process shall identify hazards and the risks arising from them. Where the hazards cannot be removed and/or the risks cannot be sufficiently reduced by inherently safe design measures, protective measures (for example safeguarding) shall be provided to reduce the risk. Additional means (for example, awareness means) shall be provided where further risk reduction is necessary. In addition, working procedures that reduce risk can be necessary.	The design and development process have identify hazards and the risks arising from them, if hazards cannot be removed and/or cannot be reduced, protective measures have been provided.	Pass
	It is recommended that, where the user is known, Annex B be used to facilitate an exchange of information between the user and the supplier(s) on basic conditions and additional user specifications related to the electrical equipment.	Series production.	NA

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>4.2</b>	<b>Selection of equipment</b>	-	-
<b>4.2.1</b>	<b>General</b>	-	-
	Electrical components and devices shall: <ul style="list-style-type: none"> <li>– be suitable for their intended use; and</li> <li>– conform to relevant IEC standards where such exist; and</li> <li>– be applied in accordance with the supplier's instructions.</li> </ul>	Electrical components and devices are suitable for the intended use; according to manufacture specification and/or IEC standards, Key components with CE certification	Pass
<b>4.2.2</b>	<b>Switchgear</b>	-	-
	In addition to the requirements of IEC 60204-1, depending upon the machine, its intended use and its electrical equipment, the designer may select parts of the electrical equipment of the machine that are in compliance with relevant parts of the IEC 61439 series (see also Annex F).	Considered by end user	Pass
<b>4.3</b>	<b>Electrical supply</b>	-	-
<b>4.3.1</b>	<b>General</b>	-	-
	The electrical equipment shall be designed to operate correctly with the conditions of the supply: <ul style="list-style-type: none"> <li>– as specified in 4.3.2 or 4.3.3, or</li> <li>– as otherwise specified by the user, or</li> <li>– as specified by the supplier of a special source of supply (see 4.3.4)</li> </ul>	The electrical equipment was designed to operate at the conditions as specified 4.3.2.	Pass
<b>4.3.2</b>	<b>AC supplies</b>	-	-
	<p>Voltage    Steady state voltage: 0,9 to 1,1 of nominal voltage.</p> <p>Frequency    0,99 to 1,01 of nominal frequency continuously; 0,98 to 1,02 short time.</p> <p>Harmonics    Harmonic distortion not exceeding 12 % of the total r.m.s. voltage between live conductors for the sum of the</p>	Design this machine to operate with the condition according to this clause.	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<p>2nd through to the 30th harmonic.</p> <p>Voltage unbalance Neither the voltage of the negative sequence component nor the voltage of the zero sequence component in three-phase supplies exceeding 2 % of the positive sequence component.</p> <p>Voltage interruption Supply interrupted or at zero voltage for not more than 3 ms at any random time in the supply cycle with more than 1 s between successive interruptions.</p> <p>Voltage dips Voltage dips not exceeding 20 % of the rms voltage of the supply for more than one cycle with more than 1 s between successive dips.</p>		
<b>4.3.3</b>	<b>DC supplies</b>	-	-
	<p>From batteries:</p> <p>Voltage 0,85 to 1,15 of nominal voltage; 0,7 to 1,2 of nominal voltage in the case of battery-operated vehicles.</p> <p>Voltage interruption Not exceeding 5 ms.</p> <p>From converting equipment:</p> <p>Voltage 0,9 to 1,1 of nominal voltage.</p> <p>Voltage interruption Not exceeding 20 ms with more than 1 s between successive interruptions.</p> <p>NOTE This is a variation to IEC Guide 106 to ensure proper operation of electronic equipment.</p> <p>Ripple (peak-to-peak) Not exceeding 0,15 of nominal voltage.</p>	Comply with this requirement.	P
<b>4.3.4</b>	<b>Special supply systems</b>	-	-
	For special supply systems (e.g. on-board generators, DC bus, etc.) the limits given in 4.3.2 and 4.3.3 may be exceeded provided that the equipment is designed to operate correctly with those conditions.	No this kind of situation	NA

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>4.4</b>	<b>Physical environment and operating conditions</b>	-	-
<b>4.4.1</b>	<b>General</b>	-	-
	The electrical equipment shall be suitable for the physical environment and operating conditions of its intended use. The requirements of 4.4.2 to 4.4.8 cover the physical environment and operating conditions of the majority of machines covered by this part of IEC 60204. When special conditions apply or the limits specified are exceeded, an exchange of information between user and supplier (see 4.1) can be necessary.	The electrical equipment has been designed to operate in the situation as specified in 4.4.2 to 4.4.8	Pass
<b>4.4.2</b>	<b>Electromagnetic compatibility (EMC)</b>	-	-
	The electrical equipment shall not generate electromagnetic disturbances above levels that are appropriate for its intended operating environment. In addition, the electrical equipment shall have a sufficient level of immunity to electromagnetic disturbances so that it can function in its intended environment.	Covered by EMC directive	Pass
<b>4.4.3</b>	<b>Ambient air temperature</b>	-	-
	Electrical equipment shall be capable of operating correctly in the intended ambient air temperature. The minimum requirement for all electrical equipment is correct operation in ambient air temperatures outside of enclosures (cabinet or box) between +5 °C and +40 °C.	The information has been stated in instruction manual.	Pass
<b>4.4.4</b>	<b>Humidity</b>	-	-
	The electrical equipment shall be capable of operating correctly when the relative humidity	The information has been stated in instruction manual.	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	does not exceed 50 % at a maximum temperature of +40 °C. Higher relative humidities are permitted at lower temperatures (for example 90 % at 20 °C).		
	Harmful effects of occasional condensation shall be avoided by design of the equipment or, where necessary, by additional measures (for example built-in heaters, air conditioners, drain holes).	The information has been stated in instruction manual.	Pass
<b>4.4.5</b>	<b>Altitude</b>	-	-
	Electrical equipment shall be capable of operating correctly at altitudes up to 1 000 m above mean sea level.	The information has been stated in instruction manual.	Pass
	For equipment to be used at higher altitudes, it is necessary to take into account changes in parameters for example, the reduction of: <ul style="list-style-type: none"> <li>– the dielectric strength, and;</li> <li>– the switching capability of the devices, and;</li> <li>– the cooling effect of the air.</li> </ul>	Not for higher altitudes	NA
	Other parameters of different components can also alter with altitude.	Not applicable.	NA
	It is recommended that the manufacturer is consulted regarding the correction factors to be used where the factors are not specified in product data.	Not applicable.	NA
<b>4.4.6</b>	<b>Contaminants</b>	-	-
	Electrical equipment shall be adequately protected against the ingress of solids and liquids (see 11.3). The electrical equipment shall be adequately protected against contaminants (for example dust, acids, corrosive gases, salts) that can be present in the physical environment in which	The IP degree of the electrical cabinets are IP54, the other electrical equipment have adequately protected against the ingress of solids, liquids and other contaminants which can be present in the installation environment of electrical equipment.	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	the electrical equipment is to be installed.		
<b>4.4.7</b>	<b>Ionizing and non-ionizing radiation</b>	-	-
	When equipment is subject to radiation (for example microwave, ultraviolet, lasers, X-rays), additional measures shall be taken to avoid malfunctioning of the equipment and accelerated deterioration of the insulation.	No such hazard existed.	NA
<b>4.4.8</b>	<b>Vibration, shock, and bump</b>	-	-
	Undesirable effects of vibration, shock and bump (including those generated by the machine and its associated equipment and those created by the physical environment) shall be avoided by the selection of suitable equipment, by mounting it away from the machine, or by provision of anti-vibration mountings.	Vibration, shock, and bump have been considered during design, and appropriate measure has been adopted to reduce these hazards.	Pass
<b>4.5</b>	<b>Transportation and storage</b>	-	-
	Electrical equipment shall be designed to withstand, or suitable precautions shall be taken to protect against, the effects of transportation and storage temperatures within a range of $-25\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$ and for short periods not exceeding 24 h at up to $+70\text{ }^{\circ}\text{C}$ . Suitable means shall be provided to prevent damage from humidity, vibration, and shock.	The transportation and storage condition has been taken into account during design. And the transportation and storage condition has been stated in instruction manual.	Pass
<b>4.6</b>	<b>Provisions for handling</b>	-	-
	Heavy and bulky electrical equipment that has to be removed from the machine for transport, or that is independent of the machine, shall be provided with suitable means for handling, including where necessary means for handling by cranes or similar equipment.	No heavy and bulky electrical equipment used on this machine.	NA
<b>5</b>	<b>Incoming supply conductor</b>	-	-

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<b>terminations and devices for disconnecting and switching off</b>		
<b>5.1</b>	<b>Incoming supply conductor terminations</b>	-	-
	It is recommended that, where practicable, the electrical equipment of a machine is connected to a single incoming supply. Where another supply is necessary for certain parts of the equipment (for example, electronic equipment that operates at a different voltage), that supply should be derived, as far as is practicable, from devices (for example, transformers, converters) forming part of the electrical equipment of the machine. For large complex machinery there can be a need for more than one incoming supply depending upon the site supply arrangements (see 5.3.1).	Single power supply.	Pass
	Unless a plug is provided with the machine for the connection to the supply (see 5.3.2 e)), it is recommended that the supply conductors are terminated at the supply disconnecting device.	Connect to the supply disconnecting device.	Pass
	Where a neutral conductor is used it shall be clearly indicated in the technical documentation of the machine, such as in the installation diagram and in the circuit diagram, and a separate insulated terminal, labelled N in accordance with 16.1, shall be provided for the neutral conductor. The neutral terminal may be provided as part of the supply disconnecting device.	Neutral conductor has been indicated in electrical diagram, N has been labeled according to this clause.	Pass
	There shall be no connection between the neutral conductor and the protective bonding circuit inside the electrical equipment.	No connection between the neutral conductor and the protective bonding circuit.	Pass
	Exception: a connection may be made	Not applicable	NA

EN 60204-1:2018											
Clause	Requirement - test	Result	Verdict								
	between the neutral terminal and the PE terminal at the point of the connection of the electrical equipment to a TN-C supply system.										
	For machines supplied from parallel sources, the requirements of IEC 60364-1 for multiple source systems apply.	Not applicable.	NA								
	Terminals for the incoming supply connection shall be clearly identified in accordance with IEC 60445. The terminal for the external protective conductor shall be identified in accordance with 5.2.	All terminals for the incoming supply connection has been identified in accordance with IEC 60445 External protective conductor terminal has been identified according to 5.2	Pass								
<b>5.2</b>	<b>Terminal for connection of the external protective conductor</b>	-	-								
	For each incoming supply, a terminal shall be provided in the same compartment as the associated line conductor terminals for connection of the machine to the external protective conductor.	The terminal for the earth conductors is in the vicinity of phase conductor terminals.	Pass								
	The terminal shall be of such a size as to enable the connection of an external protective copper conductor with a cross-sectional area determined in relation to the size of the associated line conductors in accordance with Table 1.  <table border="1"> <thead> <tr> <th>Cross-sectional area of line conductors <math>s</math> mm<sup>2</sup></th> <th>Minimum cross-sectional area of the corresponding protective conductor (PE) <math>s_p</math> mm<sup>2</sup></th> </tr> </thead> <tbody> <tr> <td><math>s \leq 16</math></td> <td><math>s</math></td> </tr> <tr> <td><math>16 &lt; s \leq 35</math></td> <td>16</td> </tr> <tr> <td><math>s &gt; 35</math></td> <td><math>s/2</math></td> </tr> </tbody> </table>	Cross-sectional area of line conductors $s$ mm <sup>2</sup>	Minimum cross-sectional area of the corresponding protective conductor (PE) $s_p$ mm <sup>2</sup>	$s \leq 16$	$s$	$16 < s \leq 35$	16	$s > 35$	$s/2$	According to table 1	Pass
Cross-sectional area of line conductors $s$ mm <sup>2</sup>	Minimum cross-sectional area of the corresponding protective conductor (PE) $s_p$ mm <sup>2</sup>										
$s \leq 16$	$s$										
$16 < s \leq 35$	16										
$s > 35$	$s/2$										
	Where an external protective conductor of a material other than copper is used, the terminal size and type shall be selected accordingly.	Only copper conductor used.	NA								
	At each incoming supply point, the terminal for connection of external protective conductor shall be marked or labelled with the letters PE	For incoming supply point, conductor has been marked with the letter PE.	Pass								

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	(see IEC 60445).		
<b>5.3</b>	<b>Supply disconnecting (isolating) device</b>	-	-
<b>5.3.1</b>	<b>General</b>	-	-
	A supply disconnecting device shall be provided: – for each incoming supply to (a) machine(s); – for each on-board power supply.	Provided.	Pass
	The supply disconnecting device shall disconnect (isolate) the electrical equipment of the machine from the supply when required (for example for work on the machine, including the electrical equipment).	Comply with the requirement.	Pass
	Where two or more supply disconnecting devices are provided, protective interlocks for their correct operation shall also be provided in order to prevent a hazardous situation, including damage to the machine or to the work in progress.	Just one supply disconnecting device provided.	NA
<b>5.3.2</b>	<b>Type</b>	-	-
	The supply disconnecting device shall be one of the following types: a) switch-disconnector, with or without fuses, in accordance with IEC 60947-3, utilization category AC-23B or DC-23B; b) control and protective switching device suitable for isolation, in accordance with IEC 60947-6-2; c) a circuit-breaker suitable for isolation in accordance with IEC 60947-2; d) any other switching device in accordance with an IEC product standard for that device and which meets the isolation requirements and the appropriate utilization category and/or specified endurance requirements defined in	Circuit-breaker provided.	Pass

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	the product standard; e) a plug/socket combination for a flexible cable supply.		
<b>5.3.3</b>	<b>Requirements</b>	-	-
	<p>Where the supply disconnecting device is one of the types specified in 5.3.2 a) to d) it shall fulfil all of the following requirements:</p> <ul style="list-style-type: none"> <li>– isolate the electrical equipment from the supply and have one OFF (isolated) and one ON position marked with "O" and "I" (symbols IEC 60417-5008 (2002-10) and IEC 60417-5007 (2002-10), see 10.2.2);</li> <li>– have a visible contact gap or a position indicator which cannot indicate OFF (isolated) until all contacts are actually open and the requirements for the isolating function have been satisfied;</li> <li>– have an operating means (see 5.3.4);</li> <li>– be provided with a means permitting it to be locked in the OFF (isolated) position (for example by padlocks). When so locked, remote as well as local closing shall be prevented;</li> <li>– disconnect all live conductors of its power supply circuit. However, for TN supply systems, the neutral conductor may or may not be disconnected except in countries where disconnection of the neutral conductor (when used) is compulsory;</li> <li>– have a breaking capacity sufficient to interrupt the current of the largest motor when stalled together with the sum of the normal running currents of all other motors and other loads. The calculated breaking capacity may be reduced by the use of a proven diversity</li> </ul>	The supply disconnecting device comply with these requirements.	Pass

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	factor. Where motor(s) are supplied by converter(s) or similar devices, the calculation should take into account the possible effect on the required breaking capacity.		
	Where the supply disconnecting device is a plug/socket combination, it shall comply with the requirements of 13.4.5 and shall have the breaking capacity, or be interlocked with a switching device that has a breaking capacity, sufficient to interrupt the current of the largest motor when stalled together with the sum of the normal running currents of all other motors and other loads. The calculated breaking capacity may be reduced by the use of a proven diversity factor. Where the interlocked switching device is electrically operated (for example a contactor) it shall have an appropriate utilisation category. Where motor(s) are supplied by converter(s) or similar devices, the calculation should take into account the possible effect on the required breaking capacity.	Not plug/socket combination.	NA
	Where the supply disconnecting device is a plug/socket combination, a switching device with an appropriate utilisation category shall be provided for switching the machine on and off. This can be achieved by the use of the interlocked switching device described above.	Not plug/socket combination.	NA
<b>5.3.4</b>	<b>Operating means of the supply disconnecting device</b>	-	-
	The operating means (for example, a handle) of the supply disconnecting device shall be external to the enclosure of the electrical equipment.	The handle is out of the electrical cabinet.	Pass
	Exception: power-operated switchgear need	Not applicable.	NA

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	not be provided with a handle outside the enclosure where other means (e.g. pushbuttons) are provided to open the supply disconnecting device from outside the enclosure.		
	The operating means of the supply disconnecting device shall be easily accessible and located between 0,6 m and 1,9 m above the servicing level. An upper limit of 1,7 m is recommended.	Between 0,6 m and 1,9 m above the servicing level	Pass
	Where the external operating means is intended for emergency operation, see 10.7.3 or 10.8.3.	Not intended for emergency operation.	NA
	Where the external operating means is not intended for emergency operations:	See below	Pass
	– it is recommended that it be coloured BLACK or GREY (see 10.2)	Grey handle.	Pass
	– a supplementary cover or door that can be readily opened without the use of a key or tool be provided, for example for protection against environmental conditions or mechanical damage. Such a cover/door shall clearly show that it provides access to the operating means. This can be achieved, for example, by use of the relevant symbol IEC 60417-6169-1 (2012-08) (Figure 2) or IEC 60417-6169-2 (2012-08), (Figure 3).	Relevant symbol provided.	Pass
<b>5.3.5</b>	<b>Excepted circuits</b>	-	-
	The following circuits need not be disconnected by the supply disconnecting device: <ul style="list-style-type: none"> <li>– lighting circuits for lighting needed during maintenance or repair;</li> <li>– socket outlets for the exclusive connection of repair or maintenance tools and</li> </ul>	No excepted circuit.	NA

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	<p>equipment (for example hand drills, test equipment) (see 15.1);</p> <ul style="list-style-type: none"> <li>– undervoltage protection circuits that are only provided for automatic tripping in the event of supply failure;</li> <li>– circuits supplying equipment that should normally remain energized for correct operation (for example temperature controlled measuring devices, heaters, program storage devices).</li> </ul>		
	It is recommended, however, that such circuits be provided with their own disconnecting device.	No excepted circuit.	NA
	Control circuits supplied via another supply disconnecting device, regardless of whether that disconnecting device is located in the electrical equipment or in another machine or other electrical equipment, need not be disconnected by the supply disconnecting device of the electrical equipment.	No excepted circuit.	NA
<b>5.4</b>	<b>Devices for removal of power for prevention of unexpected start-up</b>	-	-
	<p>Devices for removal of power for the prevention of unexpected start-up shall be provided where a start-up of the machine or part of the machine can create a hazard (for example during maintenance). Such devices shall be appropriate and convenient for the intended use, be suitably placed, and readily identifiable as to their function and purpose. Where their function and purpose is not otherwise obvious (e.g. by their location) these devices shall be marked to indicate the extent of removal of power.</p>	Main switch comply with the requirement.	Pass
	The supply disconnecting device or other	Main switch comply with the	Pass

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	devices in accordance with 5.3.2 may be used for prevention of unexpected start-up.	requirement.	
	Disconnectors, withdrawable fuse links and withdrawable links may be used for protection of unexpected start-up only if they are located in an enclosed electrical operating area (see 3.1.23).	Main switch comply with the requirement.	NA
	Devices that do not fulfil the isolation function (for example a contactor switched off by a control circuit, or Power Drive System (PDS) with a Safe Torque Off (STO) function in accordance with IEC 61800-5-2) may only be used for prevention of unexpected start-up during tasks such as: <ul style="list-style-type: none"> <li>– inspections;</li> <li>– adjustments;</li> <li>– work on the electrical equipment where: <ul style="list-style-type: none"> <li>• there is no hazard arising from electric shock (see Clause 6) and burn;</li> <li>• the switching off means remains effective throughout the work;</li> <li>• the work is of a minor nature (for example, replacement of plug-in devices without disturbing existing wiring).</li> </ul> </li> </ul>	Not applicable.	NA
	The selection of a device will be dependent on the risk assessment, taking into account the intended use of the device, and the persons who are intended to operate them.	See risk assessment report.	Pass
<b>5.5</b>	<b>Devices for isolating electrical equipment</b>	-	-
	Devices shall be provided for isolating (disconnecting) the electrical equipment or part(s) of the electrical equipment to enable work to be carried out when it is de-energised and isolated. Such devices shall be: <ul style="list-style-type: none"> <li>– appropriate and convenient for the</li> </ul>	Main switch comply with the requirement.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	intended use; <ul style="list-style-type: none"> <li>– suitably placed;</li> <li>– readily identifiable as to which part(s) or circuit(s) of the equipment is served. Where their function and purpose is not otherwise obvious (e.g. by their location) these devices shall be marked to indicate the extent of the equipment that they isolate.</li> </ul>		
	The supply disconnecting device (see 5.3) may, in some cases, fulfil that function. However, where it is necessary to work on individual parts of the electrical equipment of a machine, or on one of the machines fed by a common conductor bar, conductor wire or inductive power supply system, a disconnecting device shall be provided for each part, or for each machine, requiring separate isolation.	Main switch comply with the requirement.	Pass
	In addition to the supply disconnecting device, the following devices that fulfil the isolation function may be provided for this purpose: <ul style="list-style-type: none"> <li>– devices described in 5.3.2;</li> <li>– disconnectors, withdrawable fuse links and withdrawable links only if located in an enclosed electrical operating area (see 3.1.23) and relevant information is provided with the electrical equipment (see Clause 17).</li> </ul>	Main switch comply with the requirement.	Pass
<b>5.6</b>	<b>Protection against unauthorized, inadvertent and/ or mistaken connection</b>	-	-
	Where the devices described in 5.4 and 5.5 are located outside an enclosed electrical operating area they shall be equipped with means to secure them in the OFF position (disconnected state), (for example by provisions for padlocking, trapped key	Main switch comply with the requirement.	Pass

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	interlocking). When so secured, remote as well as local reconnection shall be prevented.		
	Where the devices described in 5.4 and 5.5 are located inside an enclosed electrical operating area other means of protection against reconnection (for example warning labels) can be sufficient.	Main switch comply with the requirement.	Pass
	However, when a plug/socket combination according to 5.3.2 e) is so positioned that it can be kept under the immediate supervision of the person carrying out the work, means for securing in the disconnected state need not be provided.	Not applicable.	NA
<b>6</b>	<b>Protection against electric shock</b>	-	-
<b>6.1</b>	<b>General</b>	-	-
	The electrical equipment shall provide protection of persons against electric shock by: <ul style="list-style-type: none"> <li>– basic protection (see 6.2 and 6.4), and;</li> <li>– fault protection (see 6.3 and 6.4).</li> </ul>	See the related clause	Pass
	The measures for protection given in 6.2, 6.3, and, for PELV, in 6.4, are a selection from IEC 60364-4-41. Where those measures are not practicable, for example due to the physical or operational conditions, other measures from IEC 60364-4-41 may be used (e.g. SELV).	Comply with these requirements.	Pass
<b>6.2</b>	<b>Basic protection</b>	-	-
<b>6.2.1</b>	<b>General</b>	-	-
	For each circuit or part of the electrical equipment, the measures of either 6.2.2 or 6.2.3 and, where applicable, 6.2.4 shall be applied.	All the clauses have been checked in compliance with.	Pass
	Exception: where those measures are not appropriate, other measures for basic	Not applicable.	NA

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	protection (for example by using barriers, by placing out of reach, using obstacles, using construction or installation techniques that prevent access) as defined in IEC 60364-4-41 may be applied (see also 6.2.5 and 6.2.6).		
	Where the equipment is located in places open to all persons, which can include children, measures of either 6.2.2 with a minimum degree of protection against contact with live parts corresponding to IP4X or IPXXD (see IEC 60529), or 6.2.3 shall be applied.	Not located in places open to all persons.	NA
<b>6.2.2</b>	<b>Protection by enclosures</b>	-	-
	Live parts shall be located inside enclosures that provide protection against contact with live parts of at least IP2X or IPXXB (see IEC 60529).	Minimum protection degree for live part while covered by control cabinet is IP2X.	Pass
	Where the top surfaces of the enclosure are readily accessible, the minimum degree of protection against contact with live parts provided by the top surfaces shall be IP4X or IPXXD.	There is no open on the top surface of the enclosure.	NA
	Opening an enclosure (i.e. opening doors, lids, covers, and the like) shall be possible only under one of the following conditions:	See below	Pass
	a) The use of a key or tool is necessary for access.	The door need to be opened using tool.	Pass
	All live parts, (including those on the inside of doors) that are likely to be touched when resetting or adjusting devices intended for such operations while the equipment is still connected, shall be protected against contact to at least IP2X or IPXXB. Other live parts on the inside of doors shall be protected against unintentional direct contact to at least IP1X or	IP2X	Pass

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	IPXXA.		
	b) The disconnection of live parts inside the enclosure before the enclosure can be opened.	Main switch comply with the requirement.	Pass
	This may be accomplished by interlocking the door with a disconnecting device (for example, the supply disconnecting device) so that the door can only be opened when the disconnecting device is open and so that the disconnecting device can only be closed when the door is closed.	Main switch comply with the requirement.	Pass
	Exception: a key or tool as prescribed by the supplier can be used to defeat the interlock provided that the following conditions are met: <ul style="list-style-type: none"> <li>– it is possible at all times while the interlock is defeated to open the disconnecting device and lock the disconnecting device in the OFF (isolated) position or otherwise prevent unauthorised closure of the disconnecting device;</li> <li>– upon closing the door, the interlock is automatically restored;</li> <li>– all live parts, (including those on the inside of doors) that are likely to be touched when resetting or adjusting devices intended for such operations while the equipment is still connected, are protected against unintentional contact with live parts to at least IP2X or IPXXB and other live parts on the inside of doors are protected against unintentional contact to at least IP1X or IPXXA;</li> <li>– relevant information about the procedures for the defeat of the interlock is provided with the instructions for use of the electrical</li> </ul>	No this kind of situation	NA

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Clause	Requirement - test	Result	Verdict
	<p>equipment (see Clause 17).</p> <ul style="list-style-type: none"> <li>– means are provided to restrict access to live parts behind doors that are not directly interlocked with the disconnecting means to skilled or instructed persons. (See 17.2 b)).</li> </ul>		
	<p>All parts that are still live after switching off the disconnecting device(s) (see 5.3.5) shall be protected against direct contact to at least IP2X or IPXXB (see IEC 60529). Such parts shall be marked with a warning sign in accordance with 16.2.1 (see also 13.2.4 for identification of conductors by colour), except for:</p> <ul style="list-style-type: none"> <li>– parts that can be live only because of connection to interlocking circuits and that are distinguished by colour as potentially live in accordance with 13.2.4;</li> <li>– the supply terminals of the supply disconnecting device when the latter is mounted alone in a separate enclosure.</li> </ul>	IP2X, warning label according to 16.2.1 has been provided.	Pass
	<p>c) Opening without the use of a key or a tool and without disconnection of live parts shall be possible only when all live parts are protected against contact to at least IP2X or IPXXB (see IEC 60529). Where barriers provide this protection, either they shall require a tool for their removal or all live parts protected by them shall be automatically disconnected when the barrier is removed. Where protection against contact is achieved in accordance with 6.2.2 c), and a hazard can be caused by manual actuation of devices (for example manual closing of contactors or relays), such actuation should be prevented by barriers or obstacles that require a tool for</p>	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	their removal.		
<b>6.2.3</b>	<b>Protection by insulation of live parts</b>	-	-
	Live parts protected by insulation shall be completely covered with insulation that can only be removed by destruction. Such insulation shall be capable of withstanding the mechanical, chemical, electrical, and thermal stresses to which it can be subjected under normal operating conditions.	For Live parts covered by insulation can only be removed by destruction, the insulation can be withstanding the related conditions.	Pass
<b>6.2.4</b>	<b>Protection against residual voltages</b>	-	-
	Live parts having a residual voltage greater than 60 V when the supply is disconnected shall be discharged to 60 V or less within a time period of 5 s provided that this rate of discharge does not interfere with the proper functioning of the equipment. Exempted from this requirement are components having a stored charge of 60 $\mu$ C or less. Where this specified rate of discharge would interfere with the proper functioning of the equipment, a durable warning notice drawing attention to the hazard and stating the delay required before the enclosure may be opened shall be displayed at an easily visible location on or immediately adjacent to the enclosure that contains the live parts.	The supply will be discharged to 60V within 1s.	Pass
	In the case of plugs or similar devices, the withdrawal of which results in the exposure of conductors (for example pins), the discharge time to 60 V shall not exceed 1 s, otherwise such conductors shall be protected to at least IP2X or IPXXB. If neither a discharge time of 1 s nor a protection of at least IP2X or IPXXB can be achieved (for example in the case of removable collectors on conductor wires,	No this situation.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	conductor bars, or slip-ring assemblies, see 12.7.4), additional switching devices or an appropriate warning, for example a warning sign drawing attention to the hazard and stating the delay required shall be provided. When the equipment is located in places open to all persons, which can include children, warnings are not sufficient and therefore a minimum degree of protection against contact with live parts to IP4X or IPXXD is required.		
<b>6.2.5</b>	<b>Protection by barriers</b>	-	-
	For protection by barriers, the requirements of IEC 60364-4-41 shall apply.	No this situation.	NA
<b>6.2.6</b>	<b>Protection by placing out of reach or protection by obstacles</b>	-	-
	For protection by placing out of reach, the requirements of IEC 60364-4-41 shall apply. For protection by obstacles, the requirements of IEC 60364-4-41 shall apply.	No this situation.	NA
	For conductor wire systems or conductor bar systems with a degree of protection less than IP2X or IPXXB, see 12.7.1.	No this situation.	NA
<b>6.3</b>	<b>Fault protection</b>	-	-
<b>6.3.1</b>	<b>General</b>	-	-
	Fault protection (3.31) is intended to prevent hazardous situations due to an insulation fault between live parts and exposed conductive parts.	Considered.	Pass
	For each circuit or part of the electrical equipment, at least one of the measures in accordance with 6.3.2 to 6.3.3 shall be applied: – measures to prevent the occurrence of a touch voltage (6.3.2); or	automatic disconnection of the supply.	Pass

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	– automatic disconnection of the supply before the time of contact with a touch voltage can become hazardous (6.3.3).		
<b>6.3.2</b>	<b>Prevention of the occurrence of a touch voltage</b>	-	-
<b>6.3.2.1</b>	<b>General</b>	-	-
	Measures to prevent the occurrence of a touch voltage include the following: <ul style="list-style-type: none"> <li>– provision of class II equipment or by equivalent insulation;</li> <li>– electrical separation.</li> </ul>	Not applicable.	NA
<b>6.3.2.2</b>	<b>Protection by provision of class II equipment or by equivalent insulation</b>	-	-
	This measure is intended to prevent the occurrence of touch voltages on the accessible parts through a fault in the basic insulation.	No this kind of situation.	NA
	This protection is provided by one or more of the following: <ul style="list-style-type: none"> <li>– class II electrical devices or apparatus (double insulation, reinforced insulation or by equivalent insulation in accordance with IEC 61140);</li> <li>– switchgear and controlgear assemblies having total insulation in accordance with IEC 61439-1;</li> <li>– supplementary or reinforced insulation in accordance with IEC 60364-4-41.</li> </ul>	No this kind of situation.	NA
<b>6.3.2.3</b>	<b>Protection by electrical separation</b>	-	-
	Electrical separation of an individual circuit is intended to prevent a touch voltage through contact with exposed conductive parts that can be energized by a fault in the basic insulation of the live parts of that circuit.	No this kind of situation.	NA

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	For this type of protection, the requirements of IEC 60364-4-41 apply.	No this kind of situation.	NA
<b>6.3.3</b>	<b>Protection by automatic disconnection of supply</b>	-	-
	Automatic disconnection of the supply of any circuit affected by an insulation fault is intended to prevent a hazardous situation resulting from a touch voltage.	Breaker provided for this function.	Pass
	This measure consists of the interruption of one or more of the line conductors by the automatic operation of a protective device in case of a fault. This interruption shall occur within a sufficiently short time to limit the duration of a touch voltage to a time within the limits specified in Annex A for TN and TT systems.	All line conductors will be interrupted.	Pass
	This measure necessitates co-ordination between: <ul style="list-style-type: none"> <li>– the type of supply system, the supply source impedance and the earthing system;</li> <li>– the impedance values of the different elements of the line and of the associated fault current paths through the protective bonding circuit;</li> <li>– the characteristics of the protective devices that detect insulation fault(s).</li> </ul>	Considered.	Pass
	This protective measure comprises both:	See below	Pass
	– protective bonding of exposed conductive parts (see 8.2.3),	See 8.2.3	Pass
	– and one of the following: <ol style="list-style-type: none"> <li>a) In TN systems, the following protective devices may be used: <ul style="list-style-type: none"> <li>· overcurrent protective devices;</li> <li>· residual current protective devices (RCDs)</li> </ul> </li> </ol> and associated overcurrent protective	TN system Overcurrent protective devices provided.	Pass

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	<p>device(s).</p> <p>b) in TT systems, either:</p> <ul style="list-style-type: none"> <li>• RCDs and associated overcurrent protective device(s) to initiate the automatic disconnection of the supply on detection of an insulation fault from a live part to exposed conductive parts or to earth, or</li> <li>• overcurrent protective devices may be used for fault protection provided a suitably low value of the fault loop impedance <math>Z_s</math> (see A.2.2.3) is permanently and reliably assured;</li> </ul> <p>c) In IT systems the relevant requirements of IEC 60364-4-41 shall be fulfilled. During an insulation fault, an acoustic and optical signal shall be sustained. After annunciation, the acoustic signal may then be manually muted. This can require an agreement between the supplier and user regarding the provision of insulation monitoring devices and/or insulation fault location system(s).</p>		
	Where automatic disconnection is provided in accordance with a), and disconnection within the time specified in A.1.1 cannot be assured, supplementary protective bonding shall be provided as necessary to meet the requirements of A.1.3.	Not applicable.	NA
	Where a power drive system (PDS) is provided, fault protection shall be provided for those circuits of the power drive system that are supplied by the converter. Where this protection is not provided within the converter, the necessary protection measures shall be in accordance with the converter manufacturer's instructions.	Not applicable.	NA
<b>6.4</b>	<b>Protection by the use of PELV</b>	-	-

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>6.4.1</b>	<b>General requirements</b>	-	-
	The use of PELV (Protective Extra-Low Voltage) is to protect persons against electric shock from indirect contact and limited area direct contact (see 8.2.1).	Comply with this clause.	Pass
	<p>PELV circuits shall satisfy all of the following conditions:</p> <p>a) the nominal voltage shall not exceed:</p> <ul style="list-style-type: none"> <li>· 25 V AC r.m.s. or 60 V ripple-free DC when the equipment is normally used in dry locations and when large area contact of live parts with the human body is not expected; or</li> <li>· 6 V AC r.m.s. or 15 V ripple-free DC in all other cases;</li> </ul> <p>b) one side of the circuit or one point of the source of the supply of that circuit shall be connected to the protective bonding circuit;</p> <p>c) live parts of PELV circuits shall be electrically separated from other live circuits. Electrical separation shall be not less than that required between the primary and secondary circuits of a safety isolating transformer (see IEC 61558-1 and IEC 61558-2-6 );</p> <p>d) conductors of each PELV circuit shall be physically separated from those of any other circuit. When this requirement is impracticable, the insulation provisions of 13.1.3 shall apply;</p> <p>e) plugs and socket-outlets for a PELV circuit shall conform to the following:</p> <ul style="list-style-type: none"> <li>· plugs shall not be able to enter socket-outlets of other voltage systems;</li> <li>· socket-outlets shall not admit plugs of other voltage systems.</li> </ul>	All the requirements has been checked in compliance with.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>6.4.2</b>	<b>Sources for PELV</b>	-	-
	<p>The source for PELV shall be one of the following:</p> <ul style="list-style-type: none"> <li>– a safety isolating transformer in accordance with IEC 61558-1 and IEC 61558-2-6;</li> <li>– a source of current providing a degree of safety equivalent to that of the safety isolating transformer (for example a motor generator with winding providing equivalent isolation);</li> <li>– an electrochemical source (for example a battery) or another source independent of a higher voltage circuit (for example a diesel-driven generator);</li> <li>– an electronic power supply conforming to appropriate standards specifying measures to be taken to ensure that, even in the case of an internal fault, the voltage at the outgoing terminals cannot exceed the values specified in 6.4.1.</li> </ul>	Power switch provided for this purpose	Pass
<b>7</b>	<b>Protection of equipment</b>	-	-
<b>7.1</b>	<b>General</b>	-	-
	<p>This Clause 7 details the measures to be taken to protect equipment against the effects of:</p> <ul style="list-style-type: none"> <li>– overcurrent arising from a short-circuit;</li> <li>– overload and/or loss of cooling of motors;</li> <li>– abnormal temperature;</li> <li>– loss of or reduction in the supply voltage;</li> <li>– overspeed of machines/machine elements;</li> <li>– earth fault/residual current;</li> <li>– incorrect phase sequence;</li> <li>– overvoltage due to lightning and switching surges.</li> </ul>	All the situations have been taken into account.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>7.2</b>	<b>Overcurrent protection</b>	-	-
<b>7.2.1</b>	<b>General</b>	-	-
	Overcurrent protection shall be provided where the current in any circuit can exceed either the rating of any component or the current carrying capacity of the conductors, whichever is the lesser value. The ratings or settings to be selected are detailed in 7.2.10.	Overcurrent device provided according to this clause.	Pass
<b>7.2.2</b>	<b>Supply conductors</b>	-	-
	Unless otherwise specified by the user, the supplier of the electrical equipment is not responsible for providing the supply conductors and the overcurrent protective device for the supply conductors to the electrical equipment.	No overcurrent protective device is provided for the supply conductor by the manufacturer.	Pass
	The supplier of the electrical equipment shall state in the installation documents the data necessary for conductor dimensioning (including the maximum cross-sectional area of the supply conductor that can be connected to the terminals of the electrical equipment) and for selecting the overcurrent protective device (see 7.2.10 and 17).	The data necessary for overcurrent protective device is provided in the electrical installation diagram.	Pass
<b>7.2.3</b>	<b>Power circuits</b>	-	-
	Devices for detection and interruption of overcurrent, selected in accordance with 7.2.10, shall be applied to each live conductor including circuits supplying control circuit transformers.	Each live conductor has their over-current protection device, See the electrical diagram.	Pass
	The following conductors, as applicable, shall not be disconnected without disconnecting all associated live conductors: – the neutral conductor of AC power circuits;	Not disconnected.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<ul style="list-style-type: none"> <li>– the earthed conductor of DC power circuits;</li> <li>– DC power conductors bonded to exposed conductive parts of mobile machines.</li> </ul>		
	Where the cross-sectional area of the neutral conductor is at least equal to or equivalent to that of the line conductors, it is not necessary to provide overcurrent detection for the neutral conductor nor a disconnecting device for that conductor. For a neutral conductor with a cross-sectional area smaller than that of the associated line conductors, the measures detailed in 524 of IEC 60364-5-52:2009 shall apply.	Equal to phase conductor.	Pass
	In IT systems, it is recommended that the neutral conductor is not used. However, where a neutral conductor is used, the measures detailed in 431.2.2 of IEC 60364-4-43:2008 shall apply.	TN system.	NA
<b>7.2.4</b>	<b>Control circuits</b>	-	-
	Conductors of control circuits directly connected to the supply voltage shall be protected against overcurrent in accordance with 7.2.3.	Overcurrent device provided in power switch.	Pass
	Conductors of control circuits supplied by a transformer or DC supply shall be protected against overcurrent (see also 9.4.3.1.1): <ul style="list-style-type: none"> <li>– in control circuits connected to the protective bonding circuit, by inserting an overcurrent protective device into the switched conductor;</li> <li>– in control circuits not connected to the protective bonding circuit;</li> <li>· where all control circuits of the equipment have the same current carrying capacity, by</li> </ul>	Overcurrent device provided in power switch.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	inserting an overcurrent protective device into the switched conductor, or; <ul style="list-style-type: none"> <li>• where different control circuits of the equipment have different current carrying capacity, by inserting an overcurrent protective device into both switched and common conductors of each control circuit.</li> </ul>		
	Exception: Where the supply unit provides current limiting below the current carrying capacity of the conductors in a circuit and below the current rating of connected components, no separate overcurrent protective device is required.	Provided in power supply.	Pass
<b>7.2.5</b>	<b>Socket outlets and their associated conductors</b>	-	-
	Overcurrent protection shall be provided for the circuits feeding the general purpose socket outlets intended primarily for supplying power to maintenance equipment. Overcurrent protective devices shall be provided in the unearthed live conductors of each circuit feeding such socket outlets. See also 15.1.	Not applicable.	NA
<b>7.2.6</b>	<b>Lighting circuits</b>	-	-
	All unearthed conductors of circuits supplying lighting shall be protected against the effects of short-circuits by the provision of overcurrent devices separate from those protecting other circuits.	Not applicable.	Pass
<b>7.2.7</b>	<b>Transformers</b>	-	-
	Transformers shall be protected by an overcurrent protective device having a type and setting in accordance with the transformer manufacturer's instructions. Such protection shall (see also 7.2.10):	overcurrent protective device provided.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<ul style="list-style-type: none"> <li>– avoid nuisance tripping due to transformer magnetizing inrush currents;</li> <li>– avoid a winding temperature rise in excess of the permitted value for the insulation class of transformer when it is subjected to the effects of a short-circuit at its secondary terminals.</li> </ul>		
<b>7.2.8</b>	<b>Location of overcurrent protective devices</b>	-	-
	<p>sectional area of the conductors or another change reduces the current-carrying capacity of the conductors, except where all the following conditions are satisfied:</p> <ul style="list-style-type: none"> <li>– the current carrying capacity of the conductors is at least equal to that of the load;</li> <li>– the part of the conductor(s) between the point of reduction of current-carrying capacity and the position of the overcurrent protective device is no longer than 3 m;</li> <li>– the conductors are installed in such a manner as to reduce the possibility of a shortcircuit, for example, protected by an enclosure or duct.</li> </ul>	Provided according to this clause.	Pass
<b>7.2.9</b>	<b>Overcurrent protective devices</b>	-	-
	The rated short-circuit breaking capacity shall be at least equal to the prospective fault current at the point of installation. Where the short-circuit current to an overcurrent protective device can include additional currents other than from the supply (for example from motors, from power factor correction capacitors), those currents shall be taken into consideration.	Every overcurrent protective device has sufficient breaking capacity.	Pass
	Where fuses are provided as overcurrent protective devices, a type readily available in the country of use shall be selected, or	Not applicable	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	arrangements shall be made for the supply of spare parts.		
<b>7.2.10</b>	<b>Rating and setting of overcurrent protective devices</b>	-	-
	The rated current of fuses or the setting current of other overcurrent protective devices shall be selected as low as possible but adequate for the anticipated overcurrents (for example during starting of motors or energizing of transformers). When selecting those protective devices, consideration shall be given to the protection of switching devices against damage due to overcurrents.	The rated current of overcurrent protective devices is selected as low as possible but adequate for the anticipated overcurrents	Pass
	The rated current or setting of an overcurrent protective device for conductors is determined by the current carrying capacity of the conductors to be protected in accordance with 12.4, Clause D.3 and the maximum allowable interrupting time $t$ in accordance with Clause D.4, taking into account the needs of co-ordination with other electrical devices in the protected circuit.	The rated current or setting of an overcurrent protective device is determined by the current carrying capacity of the conductors to be protected in accordance with 12.4, D.4. The maximum allowable interrupting time $t$ in accordance with Clause D.4	Pass
<b>7.3</b>	<b>Protection of motors against overheating</b>	-	-
<b>7.3.1</b>	<b>General</b>	-	-
	Protection of motors against overheating shall be provided for each motor rated at more than 0,5 kW.	Provided.	Pass
	Exception: In applications where an automatic interruption of the motor operation is unacceptable (for example fire pumps), the means of detection shall give a warning signal to which the operator can respond.	Not applicable.	NA
	Protection of motors against overheating can be achieved by:	Provided.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<ul style="list-style-type: none"> <li>– overload protection (7.3.2),</li> <li>– over-temperature protection (7.3.3), or</li> <li>– current-limiting protection.</li> </ul>		
	Automatic restarting of any motor after the operation of protection against overheating shall be prevented where this can cause a hazardous situation or damage to the machine or to the work in progress.	Can't automatic restarting.	Pass
<b>7.3.2</b>	<b>Overload protection</b>	-	-
	Where overload protection is provided, detection of overload(s) shall be provided in each live conductor except for the neutral conductor.	Breaker provided.	Pass
	However, where the motor overload detection is not used for cable overload protection (see also Clause D.2), detection of overload may be omitted in one of the live conductors. For motors having single-phase or DC power supplies, detection in only one unearthed live conductor is permitted.	Not applicable.	NA
	Where overload protection is achieved by switching off, the switching device shall switch off all live conductors. The switching of the neutral conductor is not necessary for overload protection.	Comply with the requirement.	Pass
	Where motors with special duty ratings are required to start or to brake frequently (for example, motors for rapid traverse, locking, rapid reversal, sensitive drilling) it can be difficult to provide overload protection with a time constant comparable with that of the winding to be protected. Appropriate protective devices designed to accommodate special duty motors or over-temperature protection (see 7.3.3) can be necessary.	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	For motors that cannot be overloaded (for example torque motors, motion drives that either are protected by mechanical overload protection devices or are adequately dimensioned), overload protection is not required.	Not applicable.	NA
<b>7.3.3</b>	<b>Over-temperature protection</b>	-	-
	The provision of motors with over-temperature protection in accordance with IEC 60034-11 is recommended in situations where the cooling can be impaired (for example dusty environments). Depending upon the type of motor, protection under stalled rotor or loss of phase conditions is not always ensured by over-temperature protection, and additional protection should then be provided.	Not applicable.	NA
	Over-temperature protection is also recommended for motors that cannot be overloaded (for example torque motors, motion drives that are either protected by mechanical overload protection devices or are adequately dimensioned), where the possibility of over-temperature exists (for example due to reduced cooling).	Not applicable.	NA
<b>7.4</b>	<b>Protection against abnormal temperature</b>	-	-
	Equipment shall be protected against abnormal temperatures that can result in a hazardous situation.	No this kind of risk.	NA
<b>7.5</b>	<b>Protection against the effects of supply interruption or voltage reduction and subsequent restoration</b>	-	-
	Where a supply interruption or a voltage reduction can cause a hazardous situation, damage to the machine, or to the work in progress, undervoltage protection shall be	No need.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	provided by, for example, switching off the machine at a predetermined voltage level.		
	Where the operation of the machine can allow for an interruption or a reduction of the voltage for a short time period, delayed undervoltage protection may be provided. The operation of the undervoltage device shall not impair the operation of any stopping control of the machine.	No under-voltage protection is used.	NA
	Upon restoration of the voltage or upon switching on the incoming supply, automatic or unexpected restarting of the machine shall be prevented where such a restart can cause a hazardous situation.	Automatic or unexpected restarting of the machine has been prevented.	Pass
	Where only a part of the machine or of the group of machines working together in a coordinated manner is affected by the voltage reduction or supply interruption, the undervoltage protection shall initiate appropriate control commands to ensure co-ordination.	No under-voltage protection is used.	NA
<b>7.6</b>	<b>Motor overspeed protection</b>	-	-
	Overspeed protection shall be provided where overspeeding can occur and could possibly cause a hazardous situation taking into account measures in accordance with 9.3.2. Overspeed protection shall initiate appropriate control responses and shall prevent automatic restarting.	No overspeed will occur	NA
	The overspeed protection should operate in such a manner that the mechanical speed limit of the motor or its load is not exceeded.	No overspeed will occur	NA
<b>7.7</b>	<b>Additional earth fault/residual current protection</b>	-	-

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	In addition to providing overcurrent protection for automatic disconnection as described in 6.3, earth fault/residual current protection can be provided to reduce damage to equipment due to earth fault currents less than the detection level of the overcurrent protection.	No this kind of risk.	NA
	The setting of the devices shall be as low as possible consistent with correct operation of the equipment.	No this kind of risk.	NA
	If fault currents with DC components are possible, an RCD of type B in accordance with IEC TR 60755 can be required.	No this kind of risk.	NA
<b>7.8</b>	<b>Phase sequence protection</b>	-	-
	Where an incorrect phase sequence of the supply voltage can cause a hazardous situation or damage to the machine, protection shall be provided.	No this kind of risk.	NA
<b>7.9</b>	<b>Protection against overvoltages due to lightning and to switching surges</b>	-	-
	Surge protective devices (SPDs) can be provided to protect against the effects of overvoltages due to lightning or to switching surges. <ul style="list-style-type: none"> <li>– SPDs for the suppression of overvoltages due to lightning shall be connected to the incoming terminals of the supply disconnecting device.</li> <li>– SPDs for the suppression of overvoltages due to switching surges shall be connected as necessary for equipment requiring such protection.</li> </ul>	No this kind of hazard exist.	NA
<b>7.10</b>	<b>Short-circuit current rating</b>	-	-
	The short-circuit current rating of the electrical equipment shall be determined. This can be	By calculation	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	done by the application of design rules or by calculation or by test.		
<b>8</b>	<b>Equipotential bonding</b>	-	-
<b>8.1</b>	<b>General</b>	-	-
	This Clause 8 provides requirements for protective bonding and functional bonding. Figure 4 illustrates those concepts.	Comply with the requirement	Pass
	Protective bonding is a basic provision for fault protection to enable protection of persons against electric shock (see 6.3.3 and 8.2).	Protective bonding has been provided.	Pass
	The objective of functional bonding (see 8.4) is to reduce: <ul style="list-style-type: none"> <li>– the consequence of an insulation failure which could affect the operation of the machine;</li> <li>– electrical disturbances to sensitive electrical equipment which could affect the operation of the machine;</li> <li>– induced currents from lightning which could damage the electric equipment.</li> </ul>	Functional bonding provided.	Pass
	Functional bonding is achieved by connection to the protective bonding circuit, but where the level of electrical disturbances on the protective bonding circuit is not sufficiently low for proper functioning of electrical equipment, it can be necessary to use separate conductors for protective and functional bonding.	Comply with the requirement.	Pass
<b>8.2</b>	<b>Protective bonding circuit</b>	-	-
<b>8.2.1</b>	<b>General</b>	-	-
	The protective bonding circuit consists of the interconnection of: <ul style="list-style-type: none"> <li>· PE terminal(s) (see 5.2);</li> </ul>	Protective bonding circuit provided.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<ul style="list-style-type: none"> <li>• the protective conductors (see 3.1.51) in the equipment of the machine including sliding contacts where they are part of the circuit;</li> <li>• the conductive structural parts and exposed conductive parts of the electrical equipment;</li> </ul> Exception: see 8.2.5. <ul style="list-style-type: none"> <li>• conductive structural parts of the machine.</li> </ul>		
	All parts of the protective bonding circuit shall be so designed that they are capable of withstanding the highest thermal and mechanical stresses that can be caused by earth-fault currents that could flow in that part of the protective bonding circuit.	Earthing According to this clause.	Pass
	The cross-sectional area of every protective conductor which does not form part of a cable or which is not in a common enclosure with the line conductor shall be not less than <ul style="list-style-type: none"> <li>– 2,5 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al if protection against mechanical damage is provided,</li> <li>– 4 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al if protection against mechanical damage is not provided.</li> </ul>	Earthing According to this clause.	Pass
	A protective conductor not forming part of a cable is considered to be mechanically protected if it is installed in a conduit, trunking or protected in a similar way. Conductive structural parts of equipment in accordance with 6.3.2.2 need not be connected to the protective bonding circuit. Conductive structural parts of the machine need not be connected to the protective bonding circuit where all the equipment provided is in accordance with 6.3.2.2.	Earthing According to this clause.	Pass
	Exposed conductive parts of equipment in accordance with 6.3.2.3 shall not be connected to the protective bonding circuit.	Comply with this requirement.	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	It is not necessary to connect exposed conductive parts to the protective bonding circuit where those parts are mounted so that they do not constitute a hazard because: <ul style="list-style-type: none"> <li>– they cannot be touched on large surfaces or grasped with the hand and they are small in size (less than approximately 50 mm × 50 mm); or</li> <li>– they are located so that either contact with live parts, or an insulation failure, is unlikely.</li> </ul>	No this situation.	NA
	This applies to small parts such as screws, rivets, and nameplates and to parts inside an enclosure, irrespective of their size (for example electromagnets of contactors or relays and mechanical parts of devices).	Noted.	Pass
<b>8.2.2</b>	<b>Protective conductors</b>	-	-
	Protective conductors shall be identified in accordance with 13.2.2.	Appropriate identification has been made in accordance with 13.2.2	Pass
	Copper conductors are preferred. Where a conductor material other than copper is used, its electrical resistance per unit length shall not exceed that of the allowable copper conductor and such conductors shall be not less than 16 mm <sup>2</sup> in cross-sectional area for reasons of mechanical durability.	Copper conductors are used.	Pass
	Metal enclosures or frames or mounting plates of electrical equipment, connected to the protective bonding circuit, may be used as protective conductors if they satisfy the following three requirements: <ul style="list-style-type: none"> <li>· their electrical continuity shall be assured by construction or by suitable connection so as to ensure protection against mechanical, chemical or electrochemical deterioration;</li> <li>· they comply with the requirements of 543.1</li> </ul>	Mounting plates have been connected to the protective bonding circuit.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<p>of IEC 60364-5-54:2011;</p> <ul style="list-style-type: none"> <li>• they shall permit the connection of other protective conductors at every predetermined tap-off point.</li> </ul>		
	<p>The cross-sectional area of protective conductors shall either be calculated in accordance with 543.1.2 of IEC 60364-5-54:2011, or selected in accordance with Table 1 (see 5.2). See also 8.2.6. and 17.2 (d) of this document. Each protective conductor shall:</p> <ul style="list-style-type: none"> <li>• be part of a multicore cable, or;</li> <li>• be in a common enclosure with the line conductor, or;</li> <li>• have a cross-sectional area of at least;</li> <li>• 2,5 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al if protection against mechanical damage is provided;</li> <li>• 4 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al if protection against mechanical damage is not provided.</li> </ul>	The cross-sectional area of protective conductors was selected according to the standard mentioned in this clause.	Pass
	<p>A protective conductor not forming part of a cable is considered to be mechanically protected if it is installed in a conduit, trunking or protected in a similar way.</p>	Noted	Pass
	<p>The following parts of the machine and its electrical equipment shall be connected to the protective bonding circuit but shall not be used as protective conductors:</p> <ul style="list-style-type: none"> <li>• conductive structural parts of the machine;</li> <li>• metal ducts of flexible or rigid construction;</li> <li>• metallic cable sheaths or armouring;</li> <li>• metallic pipes containing flammable materials such as gases, liquids, powder.</li> <li>• flexible or pliable metal conduits;</li> <li>• constructional parts subject to mechanical stress in normal service;</li> </ul>	Noted.	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	· flexible metal parts; support wires; cable trays and cable ladders.		
<b>8.2.3</b>	<b>Continuity of the protective bonding circuit</b> -	-	-
	Where a part is removed for any reason (for example routine maintenance), the protective bonding circuit for the remaining parts shall not be interrupted.	All exposed conductive parts are connected to the protective bonding circuit according to 8.2.1	Pass
	Connection and bonding points shall be so designed that their current-carrying capacity is not impaired by mechanical, chemical, or electrochemical influences. Where enclosures and conductors of aluminium or aluminium alloys are used, particular consideration should be given to the possibility of electrolytic corrosion.	Considered.	Pass
	Where the electrical equipment is mounted on lids, doors, or cover plates, continuity of the protective bonding circuit shall be ensured and a protective conductor (see 8.2.2) is recommended. Where a protective conductor is not provided, fastenings, hinges or sliding contacts designed to have a low resistance shall be used (see 18.2.2, Test 1).	Protective conductor provided.	Pass
	The continuity of conductors in cables that are exposed to damage (for example flexible trailing cables) shall be ensured by appropriate measures (for example monitoring).	Not applicable.	NA
	For requirements for the continuity of conductors using conductor wires, conductor bars and slip-ring assemblies, see 12.7.2.	Not applicable.	NA
	The protective bonding circuit shall not incorporate a switching device, an overcurrent protective device (for example switch, fuse), or other means of interruption.	No these kind of device.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	Exception: links that cannot be opened without the use of a tool and that are located in an enclosed electrical operating area may be provided for test or measurement purposes.	Not applicable.	MA
	Where the continuity of the protective bonding circuit can be interrupted by means of removable current collectors or plug/socket combinations, the protective bonding circuit shall be interrupted by a first make last break contact. This also applies to removable or withdrawable plug-in units (see also 13.4.5).	Pug/socket comply with the requirement.	Pass
<b>8.2.4</b>	<b>Protective conductor connecting points</b>	-	-
	All protective conductors shall be terminated in accordance with 13.1.1. The protective conductor connecting points are not intended, for example, to attach appliances or parts.	The protective bonding circuit has been connected accordingly.	Pass
	Each protective conductor connecting point shall be marked or labelled as such using the symbol IEC 60417-5019:2006-08 as illustrated in Figure 5: or with the letters PE, the graphical symbol being preferred, or by use of the bicolour combination GREEN-AND-YELLOW, or by any combination of these.	Label provided according to this clause.	Pass
<b>8.2.5</b>	<b>Mobile machines</b>	-	-
	On mobile machines with on-board power supplies, the protective conductors, the conductive structural parts of the electrical equipment, and those extraneous-conductive-parts which form the structure of the machine shall all be connected to a protective bonding terminal to provide protection against electric shock. Where a mobile machine is also capable of	Not mobile machine.	NA

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Clause	Requirement - test	Result	Verdict
	being connected to an external incoming power supply, this protective bonding terminal shall be the connection point for the external protective conductor.		
<b>8.2.6</b>	<b>Additional requirements for electrical equipment having earth leakage currents higher than 10 mA</b>	-	-
	<p>Where electrical equipment has an earth leakage current that is greater than 10 mA AC or DC in any protective conductor, one or more of the following conditions for the integrity of each section of the associated protective bonding circuit that carries the earth leakage current shall be satisfied:</p> <p>a) the protective conductor is completely enclosed within electrical equipment enclosures or otherwise protected throughout its length against mechanical damage;</p> <p>b) the protective conductor has a cross-sectional area of at least 10 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al;</p> <p>c) where the protective conductor has a cross-sectional area of less than 10 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al, a second protective conductor of at least the same cross-sectional area is provided up to a point where the protective conductor has a cross-sectional area not less than 10 mm<sup>2</sup> Cu or 16 mm<sup>2</sup> Al. This can require that the electrical equipment has a separate terminal for a second protective conductor.</p> <p>d) the supply is automatically disconnected in case of loss of continuity of the protective conductor;</p> <p>e) where a plug-socket combination is used,</p>	No more than 10mA	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	an industrial connector in accordance with IEC 60309 series, with adequate strain relief and a minimum protective earthing conductor cross-section of 2,5 mm <sup>2</sup> as part of a multi-conductor power cable is provided.		
	A statement shall be given in the instructions for installation that the equipment shall be installed as described in this 8.2.6.	No more than 10mA	NA
<b>8.3</b>	<b>Measures to restrict the effects of high leakage current</b>	-	-
	The effects of high leakage current can be restricted to the equipment having high leakage current by connection of that equipment to a dedicated supply transformer having separate windings. The protective bonding circuit shall be connected to exposed conductive parts of the equipment and, in addition, to the secondary winding of the transformer. The protective conductor(s) between the equipment and the secondary winding of the transformer shall comply with one or more of the arrangements described in 8.2.6.	The leakage current is less than 10mA.	NA
<b>8.4</b>	<b>Functional bonding</b>	-	-
	Protection against maloperation as a result of insulation failures can be achieved by connecting to a common conductor in accordance with 9.4.3.1.1.	Comply with the requirement.	Pass
	For recommendations regarding functional bonding to avoid maloperation due to electromagnetic disturbances, see 4.4.2 and Annex H.	Comply with the requirement.	Pass
	Functional bonding connecting points should be marked or labelled as such using the symbol IEC 60417-5020:2002-10 (see Figure	Comply with the requirement.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	6).		
<b>9</b>	<b>Control circuits and control functions</b>	-	-
<b>9.1</b>	<b>Control circuits</b>	-	-
<b>9.1.1</b>	<b>Control circuit supply</b>	-	-
	Where control circuits are supplied from an AC source, transformers having separate windings shall be used to separate the power supply from the control supply.	Power switch fitted with transformers having separate windings provided.	Pass
	Examples include: <ul style="list-style-type: none"> <li>· control transformers having separate windings in accordance with IEC 61558-2-2,</li> <li>· switch mode power supply units in accordance with IEC 61558-2-16 fitted with transformers having separate windings,</li> <li>· low voltage power supplies in accordance with IEC 61204-7 fitted with transformers having separate windings.</li> </ul>	Power switch fitted with transformers having separate windings provided.	Pass
	Where several transformers are used, it is recommended that the windings of those transformers be connected in such a manner that the secondary voltages are in phase.	Not applicable.	NA
	Exception: Transformers or switch mode power supply units fitted with transformers are not mandatory for machines with a single motor starter and/or a maximum of two control devices (for example, interlock device, start/stop control station).	Not applicable.	NA
	Where DC control circuits derived from an AC supply are connected to the protective bonding circuit (see 8.2.1), they shall be supplied from a separate winding of the AC control circuit transformer or by another control circuit transformer.	Not this kind of situation	NA
<b>9.1.2</b>	<b>Control circuit voltages</b>	-	-

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	The nominal value of the control voltage shall be consistent with the correct operation of the control circuit.	Comply with the requirement.	Pass
	The nominal voltage of AC control circuits should preferably not exceed <ul style="list-style-type: none"> <li>– 230 V for circuits with 50 Hz nominal frequency,</li> <li>– 277 V for circuits with 60 Hz nominal frequency.</li> </ul>	DC 24V	NA
	The nominal voltage of DC control circuits should preferably not exceed 220 V.	DC 24V	Pass
<b>9.1.3</b>	<b>Protection</b>	-	-
	Control circuits shall be provided with overcurrent protection in accordance with 7.2.4 and 7.2.10.	Overcurrent protection provided.	Pass
<b>9.2</b>	<b>Control functions</b>	-	-
<b>9.2.1</b>	<b>General</b>	-	-
	NOTE Subclause 9.2 does not specify requirements for the devices used to implement control functions. Examples of requirements for devices are given in Clause 10.	Noted.	Pass
<b>9.2.2</b>	<b>Categories of stop functions</b>	-	-
	There are three categories of stop functions as follows: <ul style="list-style-type: none"> <li>– stop category 0: stopping by immediate removal of power to the machine actuators (i.e. an uncontrolled stop – see 3.1.64);</li> <li>– stop category 1: a controlled stop (see 3.1.14) with power available to the machine actuators to achieve the stop and then removal of power when the stop is achieved;</li> <li>– stop category 2: a controlled stop with power remaining available to the machine</li> </ul>	Category 0 stop	Pass

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	actuators.		
<b>9.2.3</b>	<b>Operation</b>	-	-
<b>9.2.3.1</b>	<b>General</b>	-	-
	Safety functions and/or protective measures (for example interlocks (see 9.3)) shall be provided where required to reduce the possibility of hazardous situations.	Provided.	Pass
	Where a machine has more than one control station, measures shall be provided to ensure that initiation of commands from different control stations do not lead to a hazardous situation.	Only one control station	NA
<b>9.2.3.2</b>	<b>Start</b>	-	-
	Start functions shall operate by energizing the relevant circuit.	Start function are operated properly.	Pass
	The start of an operation shall be possible only when all relevant safety functions and/or protective measures are in place and are operational, except for conditions as described in 9.3.6.	Start function are operated properly.	Pass
	For those machines (for example mobile machines) where safety functions and/or protective measures cannot be applied for certain operations, starting of such operations shall be by hold-to-run controls, together with enabling devices, as appropriate.	Not applicable.	NA
	The provision of acoustic and/or visual warning signals before the starting of hazardous machine operation shall be considered during the risk assessment. Where the risk assessment determines that either or both are required the emission level of noise/light shall be suitable for the intended environment.	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	Suitable interlocks shall be provided where necessary for correct sequential starting.	Suitable interlocks considered during design.	Pass
	In the case of machines requiring the use of more than one control station to initiate a start, each of these control stations shall have a separate manually actuated start control device. The conditions to initiate a start shall be: <ul style="list-style-type: none"> <li>· all required conditions for machine operation shall be met, and</li> <li>· all start control devices shall be in the released (off) position, then</li> <li>· all start control devices shall be actuated concurrently (see 3.1.7).</li> </ul>	On one control station.	NA
<b>9.2.3.3</b>	<b>Stop</b>	-	-
	Stop category 0 and/or stop category 1 and/or stop category 2 stop functions shall be provided as indicated by the risk assessment and the functional requirements of the machine (see 4.1).	Stop has been Provided.	Pass
	Stop functions shall override related start functions.	Comply with the requirement.	Pass
	Where more than one control station is provided, stop commands from any control station shall be effective when required by the risk assessment of the machine.	Only one control station.	NA
<b>9.2.3.4</b>	<b>Emergency operations (emergency stop, emergency switching off)</b>	-	-
<b>9.2.3.4.1</b>	<b>General</b>	-	-
	Emergency stop and emergency switching off are complementary protective measures that are not primary means of risk reduction for hazards (for example trapping, entanglement, electric shock or burn) at a machine (see ISO	Emergency stop provided.	Pass

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	12100).		
	This part of IEC 60204 specifies the requirements for the emergency stop and the emergency switching off functions of the emergency operations listed in Annex E, both of which are intended to be initiated by a single human action.	Emergency stop comply with this requirement.	Pass
	Once active operation of an emergency stop (see 10.7) or emergency switching off (see 10.8) actuator has ceased following a stop or switching off command, the effect of this command shall be sustained until it is reset. This reset shall be possible only by a manual action at the device where the command has been initiated. The reset of the command shall not restart the machinery but only permit restarting.	Manual reset provided..	Pass
	It shall not be possible to restart the machinery until all emergency stop commands have been reset. It shall not be possible to reenergize the machinery until all emergency switching off commands have been reset.	Comply with the requirement.	Pass
<b>9.2.3.4.2</b>	<b>Emergency stop</b>	-	-
	Requirements for functional aspects of emergency stop equipment are given in ISO 13850.	Comply with ISO 13850	Pass
	The emergency stop shall function either as a stop category 0 or as a stop category 1. The choice of the stop category of the emergency stop depends on the results of a risk assessment of the machine.	Category 0	Pass
	Exception: In some cases, to avoid creating additional risks, it can be necessary to perform a controlled stop and maintain the	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	power to machine actuators even after stopping is achieved. The stopped condition shall be monitored and upon detection of failure of the stopped condition, power shall be removed without creating a hazardous situation.		
	In addition to the requirements for stop given in 9.2.3.3, the emergency stop function has the following requirements: <ul style="list-style-type: none"> <li>· it shall override all other functions and operations in all modes;</li> <li>· it shall stop the hazardous motion as quickly as practicable without creating other hazards;</li> <li>· reset shall not initiate a restart.</li> </ul>	Comply with the requirement.	Pass
<b>9.2.3.4.3</b>	<b>Emergency switching off</b>	-	-
	The functional aspects of emergency switching off are given in 536.4 of IEC 60364-5-53:2001.	No emergency switching off provided.	NA
	Emergency switching off should be provided where: <ul style="list-style-type: none"> <li>· basic protection (for example for conductor wires, conductor bars, slip-ring assemblies, controlgear in electrical operating areas) is achieved only by placing out of reach or by obstacles (see 6.2.6); or</li> <li>· there is the possibility of other hazards or damage caused by electricity.</li> </ul>	No emergency switching off provided.	NA
	Emergency switching off is accomplished by switching off the relevant supply by electromechanical switching devices, effecting a stop category 0 of machine actuators connected to this incoming supply. When a machine cannot tolerate this category 0 stop, it may be necessary to provide other measures, for example basic protection, so	No emergency switching off provided.	NA

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	that emergency switching off is not necessary.		
<b>9.2.3.5</b>	<b>Operating modes</b>	-	-
	Each machine can have one or more operating modes (for example manual mode, automatic mode, setting mode, maintenance mode) determined by the type of machine and its application.	No operating modes provided.	NA
	Where machinery has been designed and constructed to allow its use in several control or operating modes requiring different protective measures and having a different impact on safety, it shall be fitted with a mode selector which can be locked in each position (for example key operated switch). Each position of the selector shall be clearly identifiable and shall correspond to a single operating or control mode.	See above	NA
	The selector may be replaced by another selection method which restricts the use of certain functions of the machinery to certain categories of operator (for example access code).	See above	NA
	Mode selection by itself shall not initiate machine operation. A separate actuation of the start control shall be required.	See above	NA
	For each specific operating mode, the relevant safety functions and/or protective measures shall be implemented.	See above	NA
	Indication of the selected operating mode shall be provided (for example the position of a mode selector, the provision of an indicating light, a visual display indication).	See above	NA
<b>9.2.3.6</b>	<b>Monitoring of command actions</b>	-	-
	Movement or action of a machine or part of a	Considered during design.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	machine that can result in a hazardous situation shall be monitored by providing, for example, overtravel limiters, motor overspeed detection, mechanical overload detection or anti-collision devices.		
<b>9.2.3.7</b>	<b>Hold-to-run controls</b>	-	-
	Hold-to-run controls shall require continuous actuation of the control device(s) to achieve operation.	No this kind of device.	NA
<b>9.2.3.8</b>	<b>Two-hand control</b>	-	-
	Three types of two-hand control are defined in ISO 13851, the selection of which is determined by the risk assessment. These shall have the following features: <ul style="list-style-type: none"> <li>· the provision of two control devices and their concurrent actuation by both hands;</li> <li>· continuous concurrent actuation during the hazardous situation;</li> <li>· machine operation shall cease upon the release of either one or both of the control devices when hazardous situations are still present.</li> </ul>	No this kind of device.	NA
	A Type I two-hand control device is not considered to be suitable for the initiation of hazardous operation.	No this kind of device.	NA
	Type II: a Type I control requiring the release of both control devices before machine operation can be reinitiated.	No this kind of device.	NA
	Type III: a Type II control requiring concurrent actuation of the control devices as follows: <ul style="list-style-type: none"> <li>· it shall be necessary to actuate the control devices within a certain time limit of each other, not exceeding 0,5 s;</li> <li>· where this time limit is exceeded, both control devices shall be released before</li> </ul>	No this kind of device.	NA

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	machine operation can be initiated.		
<b>9.2.3.9</b>	<b>Enabling control</b>	-	-
	Enabling control (see also 10.9) is a manually activated control function interlock that: a) when activated allows a machine operation to be initiated by a separate start control, and b) when de-activated · initiates a stop function, and · prevents initiation of machine operation.	No this kind of device.	NA
	Enabling control shall be so arranged as to minimize the possibility of defeating, for example by requiring the de-activation of the enabling control device before machine operation may be reinitiated.	No this kind of device.	NA
<b>9.2.3.10</b>	<b>Combined start and stop controls</b>	-	-
	Push-buttons and similar control devices that, when operated, alternately initiate and stop motion shall only be provided for functions which cannot result in a hazardous situation.	No this kind of device.	NA
<b>9.2.4</b>	<b>Cableless control system (CCS)</b>	-	-
<b>9.2.4.1</b>	<b>General requirements</b>	-	-
	Subclause 9.2.4 deals with the functional requirements of control systems employing cableless (for example radio, infra-red) techniques for transmitting control signals and data between operator control station(s) and other parts of the control system(s).	No this kind of device.	NA
	Where a safety function of a CCS relies on data transmission the transmission reliability shall be considered.	No this kind of device.	NA
	The CCS shall have functionality and a response time suitable for the application based on the risk assessment.	No this kind of device.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>9.2.4.2</b>	<b>Monitoring the ability of a cableless control system to control a machine</b>	-	-
	The ability of a cableless control system (CCS) to control a machine shall be automatically monitored, either continuously or at suitable intervals. The status of this ability shall be clearly indicated (for example, by an indicating light, a visual display indication, etc.)	No this kind of device.	NA
	If the communication signal is degraded in a manner that might lead to the loss of the ability of a CCS to control a machine (e.g., reduced signal level, low battery power) a warning to the operator shall be provided before the ability of the CCS to control a machine is lost.	No this kind of device.	NA
	When the ability of a CCS to control a machine has been lost for a time that is determined from a risk assessment of the application, an automatic stop of the machine shall be initiated.	No this kind of device.	NA
	Restoration of the ability of a CCS to control a machine shall not restart the machine. Restart shall require a deliberate action, for example manual actuation of a start button.	No this kind of device.	NA
<b>9.2.4.3</b>	<b>Control limitation</b>	-	-
	Measures shall be taken (e.g. coded transmission) to prevent the machine from responding to signals other than those from the intended cableless operator control station(s).	No this kind of device.	NA
	Cableless operator control station(s) shall only control the intended machine(s) and shall affect only the intended machine functions.	No this kind of device.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>9.2.4.4</b>	<b>Use of multiple cableless operator control stations</b>	-	-
	<p>When more than one cableless operator control station is used to control a machine, then:</p> <ul style="list-style-type: none"> <li>· only one cableless operator control station shall be enabled at a time except as necessary for the operation of the machine;</li> <li>· transfer of control from one cableless operator control station to another shall require a deliberate manual action at the control station that has control;</li> <li>· during machine operation, transfer of control shall only be possible when both cableless operator control stations are set to the same mode of machine operation and/or function(s) of the machine;</li> <li>· transfer of control shall not change the selected mode of machine operation and/or function(s) of the machine;</li> <li>· each cableless operator control station that has control of the machine shall be provided with an indication that it has control (by for example, the provision of an indicating light, a visual display indication).</li> </ul>	No this kind of device.	NA
<b>9.2.4.5</b>	<b>Portable cableless operator control stations</b>	-	-
	Portable cableless operator control stations shall be provided with means (for example key operated switch, access code) to prevent unauthorized use.	No this kind of device.	NA
	Each machine under cableless control should have an indication when it is under cableless control.	No this kind of device.	NA
	When a portable cableless operator control	No this kind of device.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	station can be connected to one or more of several machines, means shall be provided on the portable cableless operator control station to select which machine(s) is to be connected. Selecting a machine to be connected shall not initiate control commands.		
<b>9.2.4.6</b>	<b>Deliberate disabling of cableless operator control stations</b>	-	-
	Where a cableless operator control station is disabled when under control, the associated machine shall meet the requirements for loss of ability of a CCS to control a machine in 9.2.4.2.	No this kind of device.	NA
	Where it is necessary to disable a cableless operator control station without interrupting machine operation, means shall be provided (for example on the cableless operator control station) to transfer control to another fixed or portable control station.	No this kind of device.	NA
<b>9.2.4.7</b>	<b>Emergency stop devices on portable cableless operator control stations</b>	-	-
	Emergency stop devices on portable cableless operator control stations shall not be the sole means of initiating the emergency stop function of a machine.	No this kind of device.	NA
	Confusion between active and inactive emergency stop devices shall be avoided by appropriate design and information for use. See also ISO 13850.	No this kind of device.	NA
<b>9.2.4.8</b>	<b>Emergency stop reset</b>	-	-
	Restarting of cableless control after power loss, disabling and re-enabling, loss of communication, or failure of parts of the CCS shall not result in a reset of an emergency	No this kind of device.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	stop condition		
	The instructions for use shall state that the reset of an emergency stop condition initiated by a portable cableless operator control station shall only be performed when it can be seen that the reason for initiation has been cleared.	No this kind of device.	NA
	Where the risk assessment show that resetting of an emergency stop actuator on the portable cableless operator control station is not adequate then one or more supplementary fixed resets shall be provided.	No this kind of device.	NA
<b>9.3</b>	<b>Protective interlocks</b>	-	-
<b>9.3.1</b>	<b>Reclosing or resetting of an interlocking safeguard</b>	-	-
	The reclosing or resetting of an interlocking safeguard shall not initiate hazardous machine operation.	No interlocking guard.	NA
<b>9.3.2</b>	<b>Exceeding operating limits</b>	-	-
	Where an operating limit (for example speed, pressure, position) can be exceeded leading to a hazardous situation, means shall be provided to detect when a predetermined limit(s) is exceeded and initiate an appropriate control action.	Not applicable.	NA
<b>9.3.3</b>	<b>Operation of auxiliary functions</b>	-	-
	The correct operation of auxiliary functions shall be checked by appropriate devices (for example pressure sensors).	Not applicable.	NA
	Where the non-operation of a motor or device for an auxiliary function (for example lubrication, supply of coolant, swarf removal) can cause a hazardous situation, or cause damage to the machine or to the work in	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	progress, appropriate interlocking shall be provided.		
<b>9.3.4</b>	<b>Interlocks between different operations and for contrary motions</b>	-	-
	All contactors, relays, and other control devices that control elements of the machine and that can cause a hazardous situation when actuated at the same time (for example those which initiate contrary motion), shall be interlocked against incorrect operation.	Not applicable.	NA
	Reversing contactors (for example those controlling the direction of rotation of a motor) shall be interlocked in such a way that in normal service no short-circuit can occur when switching.	Not applicable.	NA
	Where, for safety or for continuous operation, certain functions on the machine are required to be interrelated, proper co-ordination shall be ensured by suitable interlocks. For a group of machines working together in a co-ordinated manner and having more than one controller, provision shall be made to co-ordinate the operations of the controllers as necessary.	Not applicable.	NA
	Where a failure of a mechanical brake actuator can result in the brake being applied when the associated machine actuator is energized and a hazardous situation can result, interlocks shall be provided to switch off the machine actuator.	Not applicable.	NA
<b>9.3.5</b>	<b>Reverse current braking</b>	-	-
	Where braking of a motor is accomplished by current reversal, measures shall be provided to prevent the motor starting in the opposite direction at the end of braking where that	Not applicable.	NA

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Clause	Requirement - test	Result	Verdict
	reversal can cause a hazardous situation or damage to the machine or to the work in progress. For this purpose, a device operating exclusively as a function of time is not permitted.		
	Control circuits shall be so arranged that rotation of a motor shaft, for example by applying a manual force or any other force causing the shaft to rotate after it has stopped, shall not result in a hazardous situation.	Not applicable.	NA
<b>9.3.6</b>	<b>Suspension of safety functions and/or protective measures</b>	-	-
	Where it is necessary to suspend safety functions and/or protective measures (for example for setting or maintenance purposes), the control or operating mode selector shall simultaneously: <ul style="list-style-type: none"> <li>· disable all other operating (control) modes;</li> <li>· permit operation only by the use of a hold-to-run device or by a similar control device positioned so as to permit sight of the hazardous elements;</li> <li>· permit operation of the hazardous elements only in reduced risk conditions (e.g. reduced speed, reduced power / force, step-by-step operation, e.g. with a limited movement control device);</li> <li>· prevent any operation of hazardous functions by voluntary or involuntary action on the machine's sensors.</li> </ul>	Not this kind of function.	NA
	If these four conditions cannot be fulfilled simultaneously, the control or operating mode selector shall activate other protective measures designed and constructed to ensure a safe intervention zone. In addition,		

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	the operator shall be able to control operation of the parts he is working on from the adjustment point.		
<b>9.4</b>	<b>Control functions in the event of failure</b>	-	-
<b>9.4.1</b>	<b>General requirements</b>	-	-
	Where failures or disturbances in the electrical equipment can cause a hazardous situation or damage to the machine or to the work in progress, appropriate measures shall be taken to minimize the probability of the occurrence of such failures or disturbances. The required measures and the extent to which they are implemented, either individually or in combination, depend on the level of risk associated with the respective application (see 4.1).	Considered.	Pass
	Examples of such measures that can be appropriate include but are not limited to: <ul style="list-style-type: none"> <li>· protective interlocking of the electrical circuit;</li> <li>· use of proven circuit techniques and components (see 9.4.2.2);</li> <li>· provision of partial or complete redundancy (see 9.4.2.3) or diversity (see 9.4.2.4);</li> <li>· provision for functional tests (see 9.4.2.5).</li> </ul>	ISO 13849-1, ISO 13849-2 applied.	Pass
	The electrical control system(s) shall have an appropriate performance that has been determined from the risk assessment of the machine.	ISO 13849-1, ISO 13849-2 applied.	Pass
	The requirements for safety-related control functions of IEC 62061 and/or ISO 13849-1, ISO 13849-2 shall apply.	ISO 13849-1, ISO 13849-2 applied.	Pass
	Where functions performed by the electrical control system(s) have safety implications but application of IEC 62061 leads to a required	Not applicable.	NA

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Clause	Requirement - test	Result	Verdict
	safety integrity less than that required by SIL 1, compliance with the requirements of this part of IEC 60204 can lead to an adequate performance of the electrical control system(s).		
	Where memory retention is achieved for example, by battery power, measures shall be taken to prevent hazardous situations arising from failure, undervoltage or removal of the battery.	Not applicable.	NA
	Means shall be provided to prevent unauthorized or inadvertent memory alteration by, for example, requiring the use of a key, access code or tool.	No this kind of risk	NA
<b>9.4.2</b>	<b>Measures to minimize risk in the event of failure</b>	-	-
<b>9.4.2.1</b>	<b>General</b>	-	-
	Measures to minimize risk in the event of failure include but are not limited to: <ul style="list-style-type: none"> <li>· use of proven circuit techniques and components;</li> <li>· provisions of partial or complete redundancy;</li> <li>· provision of diversity;</li> <li>· provision for functional tests.</li> </ul>	ISO 13849-1, ISO 13849-2 applied.	Pass
<b>9.4.2.2</b>	<b>Use of proven circuit techniques and components</b>	-	-
	These measures include but are not limited to: <ul style="list-style-type: none"> <li>· bonding of control circuits to the protective bonding circuit for functional purposes (see 9.4.3.1.1 and Figure 4);</li> <li>· connection of control devices in accordance with 9.4.3.1.1;</li> <li>· stopping by de-energizing;</li> <li>· the switching of all control circuit conductors</li> </ul>	Applied.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	(for example both sides of a coil) of the device being controlled; <ul style="list-style-type: none"> <li>• switching devices having direct opening action (see IEC 60947-5-1);</li> <li>• monitoring by: <ul style="list-style-type: none"> <li>– use of mechanically linked contacts (see IEC 60947-5-1);</li> <li>– use of mirror contacts (see IEC 60947-4-1);</li> </ul> </li> <li>• circuit design to reduce the possibility of failures causing undesirable operations.</li> </ul>		
<b>9.4.2.3</b>	<b>Provisions of partial or complete redundancy</b>	-	-
	By providing partial or complete redundancy, it is possible to minimize the probability that one single failure in the electrical circuit can result in a hazardous situation. Redundancy can be effective in normal operation (on-line redundancy) or designed as special circuits that take over the protective function (off-line redundancy) only where the operating function fails.	Used for safety circuit.	Pass
	Where off-line redundancy which is not active during normal operation is provided, suitable measures shall be taken to ensure that those control circuits are available when required.	Not applicable.	NA
<b>9.4.2.4</b>	<b>Provision of diversity</b>	-	-
	The use of control circuits having different principles of operation, or using different types of components or devices can reduce the probability of hazards resulting from faults and/or failures. Examples include: <ul style="list-style-type: none"> <li>– the use of a combination of normally open and normally closed contacts;</li> <li>– the use of different types of control</li> </ul>	Used for safety circuit.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<p>devices in the circuit(s);</p> <ul style="list-style-type: none"> <li>– the combination of electromechanical and electronic equipment in redundant configurations.</li> </ul>		
	The combination of electrical and non-electrical systems (for example mechanical, hydraulic, pneumatic) may perform the redundant function and provide the diversity.	Not applicable.	NA
<b>9.4.2.5</b>	<b>Provision for functional tests</b>	-	-
	Functional tests may be carried out automatically by the control system, or manually by inspection or tests at start-up and at predetermined intervals, or a combination as appropriate (see also 17.2 and 18.6).	Functional test provided.	Pass
<b>9.4.3</b>	<b>Protection against malfunction of control circuits</b>	-	-
<b>9.4.3.1</b>	<b>Insulation faults</b>	-	-
<b>9.4.3.1.1</b>	<b>General</b>	-	-
	Measures shall be provided to reduce the probability that insulation faults on any control circuit can cause malfunction such as unintentional starting, potentially hazardous motions, or prevent stopping of the machine.	Considered, see below	Pass
	<p>The measures to meet the requirements include but are not limited to the following methods:</p> <ul style="list-style-type: none"> <li>– method a) Earthed control circuits fed by transformers;</li> <li>– method b) Non-earthed control circuits fed by transformers;</li> <li>– method c) Control circuits fed by transformer with an earthed centre-tap winding;</li> </ul>	Overcurrent and earthing according to this clause, see electrical diagram.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	– method d) Control circuits not fed by a transformer.		
<b>9.4.3.1.2</b>	<b>Method a)</b> – <b>Earthed control circuits fed by transformers</b>	See below	Pass
	The common conductor shall be connected to the protective bonding circuit at the point of supply. All contacts, solid state elements, etc., which are intended to operate an electromagnetic or other device (for example, a relay, indicator light) are to be inserted between the switched conductor of the control circuit supply and one terminal of the coil or device. The other terminal of the coil or device is connected directly to the common conductor of the control circuit supply without any switching elements (see Figure 7).	Protective device and earthing provided according to this clause.	Pass
	Exception: Contacts of protective devices may be connected between the common conductor and the coils, provided that the connection is very short (for example in the same enclosure) so that an earth fault is unlikely (for example overload relays directly fitted to contactors).	Not applicable.	NA
<b>9.4.3.1.3</b>	<b>Method b)</b> – <b>Non-earthed control circuits fed by transformers</b>	-	-
	Control circuits fed from a control transformer that is not connected to the protective bonding circuit shall either: 1) have 2-pole control switches that operate on both conductors, see Figure 8; or 2) be provided with a device, for example an insulation monitoring device, that interrupts the circuit automatically in the event of an earth fault, see Figure 9; or 3) where an	Not applicable.	NA

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	interruption as per item 2 above would increase the risk, for example when continued operation is required during the first fault to earth, it can be sufficient to provide an insulation monitoring device (e.g. in accordance with IEC 61557-8) that will initiate an acoustic and optical signal at the machine, see Figure 10. Requirements for the procedure to be performed by the machine user in response to this alarm shall be described in the information for use.		
<b>9.4.3.1.4</b>	<b>Method c)</b> – <b>Control circuits fed by transformer with an earthed centre-tap winding</b>	Not applicable.	NA
	Control circuits fed from a control transformer with its centre-tap winding connected to the protective bonding circuit shall have overcurrent protective devices that break both the conductors.	Not applicable.	NA
	The control switches shall be 2-pole types that operate on both conductors.	Not applicable.	NA
<b>9.4.3.1.5</b>	<b>Method d)</b> – <b>Control circuits not fed by a transformer</b>	Not applicable.	NA
	Control circuits that are not fed by a control transformer or switch mode power supply units fitted with transformers having separate windings in accordance with IEC 61558-2-16 are only allowed for machines with a maximum of one motor starter and/or maximum of two control devices, in accordance with 9.1.1.	Not applicable.	NA
	Depending on the earthing of the supply system the possible cases are: 1) directly connected to an earthed supply system (TN-	Not applicable.	NA

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	<p>or TT-system) and:</p> <p>a) being powered between a line conductor and the neutral conductor, see Figure 12; or</p> <p>b) being powered between two line conductors, see Figure 13; or 2) directly connected to a supply system that is not earthed or is earthed through a high impedance (IT-system) and:</p> <p>a) being powered between a line conductor and the neutral conductor, see Figure 14; or</p> <p>b) being powered between two line conductors, see Figure 15.</p>		
	Method d1b) requires multi-pole control switches that switch all live conductors in order to avoid an unintentional start in case of an earth fault in the control circuit.	Not applicable.	NA
	Method d2) requires that a device shall be provided that interrupts the circuit automatically in the event of an earth fault.	Not applicable.	NA
<b>9.4.3.2</b>	<b>Voltage interruptions</b>	-	-
	See also 7.5.	See related clause.	Pass
	Where the control system uses a memory device(s), proper functioning in the event of power failure shall be ensured (for example by using a non-volatile memory) to prevent any loss of memory that can result in a hazardous situation.	Not applicable.	NA
<b>9.4.3.3</b>	<b>Loss of circuit continuity</b>	-	-
	Where the loss of continuity of control circuits depending upon sliding contacts can result in a hazardous situation, appropriate measures shall be taken (for example by duplication of the sliding contacts).	No this kind of risk.	NA
<b>10</b>	<b>Operator interface and</b>	-	-

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<b>machine-mounted control devices</b>		
<b>10.1</b>	<b>General</b>	-	-
<b>10.1.1</b>	<b>General requirements</b>	-	-
	Control devices for operator interface shall, as far as is practicable, be selected, mounted, and identified or coded in accordance with IEC 61310 series.	Control devices have been selected, mounted, and identified or coded in accordance with relevant parts of IEC 61310	Pass
	The possibility of inadvertent operation shall be minimized by, for example, positioning of devices, suitable design, provision of additional protective measures. Particular consideration shall be given to the selection, arrangement, programming and use of operator input devices such as touchscreens, keypads and keyboards for the control of hazardous machine operations, and of sensors (for example position sensors) that can initiate machine operation. Further information can be found in IEC 60447.	The possibility of inadvertent operation has been considered during design.	Pass
	Ergonomic principles shall be taken into account in the location of operator interface devices.	Considered during design.	Pass
<b>10.1.2</b>	<b>Location and mounting</b>	-	-
	As far as is practicable, machine-mounted control devices shall be: <ul style="list-style-type: none"> <li>· readily accessible for service and maintenance;</li> <li>· mounted in such a manner as to minimize the possibility of damage from activities such as material handling.</li> </ul>	Control devices can accessible readily for service and maintenance. All the possibility of damage from activities has been considered during design.	Pass
	The actuators of hand-operated control devices shall be selected and installed so that: <ul style="list-style-type: none"> <li>· they are not less than 0,6 m above the servicing level and are within easy reach of</li> </ul>	All hand-operated control devices installed more than 0.6m above the servicing level except switch used to maintain the machine. When operating the machine, no hazard was found on	Pass

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	the normal working position of the operator; <ul style="list-style-type: none"> <li>· the operator is not placed in a hazardous situation when operating them.</li> </ul>	this machine.	
	The actuators of foot-operated control devices shall be selected and installed so that: <ul style="list-style-type: none"> <li>· they are within easy reach of the normal working position of the operator;</li> <li>· the operator is not placed in a hazardous situation when operating them.</li> </ul>	No foot-operated control device.	NA
<b>10.1.3</b>	<b>Protection</b>	-	-
	The degree of protection (IP rating in accordance with IEC 60529) together with other appropriate measures shall provide protection against: <ul style="list-style-type: none"> <li>· the effects of liquids, vapours, or gases found in the physical environment or used on the machine;</li> <li>· the ingress of contaminants (for example swarf, dust, particulate matter).</li> </ul>	IP54	Pass
	In addition, the operator interface control devices shall have a minimum degree of protection against contact with live parts of IPXXD in accordance with IEC 60529.	IPXXD	Pass
<b>10.1.4</b>	<b>Position sensors</b>	-	-
	Position sensors (for example position switches, proximity switches) shall be so arranged that they will not be damaged in the event of overtravel.	No position sensor used.	NA
	Position sensors in circuits with safety-related control functions (for example, to maintain the safe condition of the machine or prevent hazardous situations arising at the machine) shall have direct opening action (see IEC 60947-5-1) or shall provide similar reliability (see 9.4.2).	No position sensor used.	NA

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<b>10.1.5</b>	<b>Portable and pendant control stations</b>	-	-
	Portable and pendant operator control stations and their control devices shall be so selected and arranged as to minimize the possibility of machine operations caused by inadvertent actuation, shocks and vibrations (for example if the operator control station is dropped or strikes an obstruction) (see also 4.4.8).	No this kind of control station provided.	NA
<b>10.2</b>	<b>Actuators</b>	-	-
<b>10.2.1</b>	<b>Colours</b>	-	-
	Actuators (see 3.1.1) shall be colour-coded as follows.	The suitable colour according to this clause used for push button.	Pass
	The colours for START/ON actuators should be WHITE, GREY, BLACK or GREEN with a preference for WHITE. RED shall not be used.	applied	Pass
	The colour RED shall be used for emergency stop and emergency switching off actuators (including supply disconnecting devices where it is foreseen that they are for use in an emergency). If a background exists immediately around the actuator, then this background shall be coloured YELLOW. The combination of a RED actuator with a YELLOW background shall only be used for emergency operation devices.	applied	Pass
	The colours for STOP/OFF actuators should be BLACK, GREY, or WHITE with a preference for BLACK. GREEN shall not be used. RED is permitted, but it is recommended that RED is not used near an emergency operation device.	applied	Pass
	WHITE, GREY, or BLACK are the preferred colours for actuators that alternately act as	applied	Pass

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	START/ON and STOP/OFF actuators. The colours RED, YELLOW, or GREEN shall not be used.		
	WHITE, GREY, or BLACK are the preferred colours for actuators that cause operation while they are actuated and cease the operation when they are released (for example hold-to-run). The colours RED, YELLOW, or GREEN shall not be used.	applied	Pass
	Reset actuators shall be BLUE, WHITE, GREY, or BLACK. Where they also act as a STOP/OFF actuator, the colours WHITE, GREY, or BLACK are preferred with the main preference being for BLACK. GREEN shall not be used.	applied	Pass
	The colour YELLOW is reserved for use in abnormal conditions, for example, in the event of an abnormal condition of the process, or to interrupt an automatic cycle.	Not applicable.	NA
	Where the same colour WHITE, GREY, or BLACK is used for various functions (for example WHITE for START/ON and for STOP/OFF actuators) a supplementary means of coding (for example shape, position, symbol) shall be used for the identification of actuators.	Not applicable.	NA
<b>10.2.2</b>	<b>Markings</b>	-	-
	In addition to the functional identification as described in 16.3, recommended symbols to be placed near to or preferably directly on certain actuators are given in Table 2 or 3.	Markings provided according to this clause.	Pass
<b>10.3</b>	<b>Indicator lights and displays</b>	-	-
<b>10.3.1</b>	<b>General</b>	-	-
	Indicator lights and displays serve to give the	Indicator light and display provided.	Pass

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	<p>following types of information:</p> <ul style="list-style-type: none"> <li>– indication: to attract the operator's attention or to indicate that a certain task should be performed. The colours RED, YELLOW, BLUE, and GREEN are normally used in this mode; for flashing indicator lights and displays, see 10.3.3.</li> <li>– confirmation: to confirm a command, or a condition, or to confirm the termination of a change or transition period. The colours BLUE and WHITE are normally used in this mode and GREEN may be used in some cases.</li> </ul>		
	Indicator lights and displays shall be selected and installed in such a manner as to be visible from the normal position of the operator (see also IEC 61310-1).	Comply with IEC 61310-1	Pass
	Circuits used for visual or audible devices used to warn persons of an impending hazardous event shall be fitted with facilities to check the operability of these devices.	Comply with this clause.	Pass
<b>10.3.2</b>	<b>Colours</b>	-	-
	Indicator lights should be colour-coded with respect to the condition (status) of the machine in accordance with Table 4.	colour-coded according to table 4	Pass
	Indicating towers on machines should have the applicable colours in the following order from the top down; RED, YELLOW, BLUE, GREEN and WHITE.	Not applicable.	NA
<b>10.3.3</b>	<b>Flashing lights and displays</b>	-	-
	<p>For further distinction or information and especially to give additional emphasis, flashing lights and displays can be provided for the following purposes:</p> <ul style="list-style-type: none"> <li>– to attract attention;</li> <li>– to request immediate action;</li> </ul>	Flashing light and display provided.	Pass

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	<ul style="list-style-type: none"> <li>– to indicate a discrepancy between the command and actual state;</li> <li>– to indicate a change in process (flashing during transition).</li> </ul>		
	It is recommended that higher flashing frequencies are used for higher priority information (see IEC 60073 for recommended flashing rates and pulse/pause ratios).	Comply with IEC 60073	Pass
	Where flashing lights or displays are used to provide higher priority information, additional acoustic warnings should be considered.	Not applicable.	NA
<b>10.4</b>	<b>Illuminated push-buttons</b>	-	-
	Illuminated push-button actuators shall be colour-coded in accordance with 10.2.1. Where there is difficulty in assigning an appropriate colour, WHITE shall be used.	No used.	NA
	The colour of active emergency stop actuators shall remain RED regardless of the state of the illumination.	No used.	NA
<b>10.5</b>	<b>Rotary control devices</b>	-	-
	Devices having a rotational member, such as potentiometers and selector switches, shall have means of prevention of rotation of the stationary member. Friction alone shall not be considered sufficient.	No used.	NA
<b>10.6</b>	<b>Start devices</b>	-	-
	Actuators used to initiate a start function or the movement of machine elements (for example slides, spindles, carriers) shall be constructed and mounted so as to minimize inadvertent operation.	Appropriate provision to minimize inadvertent operation provided for the start devices.	Pass
<b>10.7</b>	<b>Emergency stop devices</b>	-	-
<b>10.7.1</b>	<b>Location of emergency stop devices</b>	-	-
	Devices for emergency stop shall be readily	Accessible at operation position.	Pass

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	accessible.		
	Emergency stop devices shall be provided at each location where the initiation of an emergency stop can be required.	Provided at operation position.	Pass
	There can be circumstances where confusion can occur between active and inactive emergency stop devices caused by, for example, unplugging or otherwise disabling an operator control station. In such cases, means (for example, design and information for use) shall be provided to minimise confusion.	Considered during design.	Pass
<b>10.7.2</b>	<b>Types of emergency stop device</b>	-	-
	The types of device for emergency stop include, but are not limited to: <ul style="list-style-type: none"> <li>· a push-button device for actuation by the palm or the fist (e.g. mushroom head type);</li> <li>· a pull-cord operated switch;</li> <li>· a pedal-operated switch without a mechanical guard.</li> </ul>	Push-button device.	Pass
	The devices shall be in accordance with IEC 60947-5-5.	Comply with IEC 60947-5-5	Pass
<b>10.7.3</b>	<b>Operation of the supply disconnecting device to effect emergency stop</b>	-	-
	Where a stop category 0 is suitable, the supply disconnecting device may serve the function of emergency stop where: <ul style="list-style-type: none"> <li>· it is readily accessible to the operator; and</li> <li>· it is of the type described in 5.3.2 a), b), c), or d).</li> </ul>	Comply with these requirements.	Pass
	Where intended for emergency use, the supply disconnecting device shall meet the colour requirements of 10.2.1.	Not applicable.	NA
<b>10.8</b>	<b>Emergency switching off devices</b>	-	-

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<b>10.8.1</b>	<b>Location of emergency switching off devices</b>	-	-
	Emergency switching off devices shall be located as necessary for the given application. Normally, those devices will be located separate from operator control stations. Where confusion can occur between emergency stop and emergency switching off devices, means shall be provided to minimise confusion.	No emergency switching off device.	NA
<b>10.8.2</b>	<b>Types of emergency switching off device</b>	-	-
	The types of device for initiation of emergency switching off include: <ul style="list-style-type: none"> <li>· a push-button operated switch with a palm or mushroom head type of actuator;</li> <li>· a pull-cord operated switch.</li> </ul>	No emergency switching off device.	NA
	The devices shall have direct opening action (see Annex K of IEC 60947-5-1:2003 and IEC 60947-5-1:2003/AMD1:2009).	No emergency switching off device.	NA
<b>10.8.3</b>	<b>Local operation of the supply disconnecting device to effect emergency switching off</b>	-	-
	Where the supply disconnecting device is to be locally operated for emergency switching off, it shall be readily accessible and shall meet the colour requirements of 10.2.1.	No emergency switching off device.	NA
<b>10.9</b>	<b>Enabling control device</b>	-	-
	The enabling control function is described in 9.2.3.9.	No enabling control device.	NA
	Enabling control devices shall be selected and arranged so as to minimize the possibility of defeating.	No enabling control device.	NA
	Enabling control devices shall be selected that have the following features:	No enabling control device.	NA

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	<ul style="list-style-type: none"> <li>– designed in accordance with ergonomic principles;</li> <li>– for a two-position type:               <ul style="list-style-type: none"> <li>• position 1: off-function of the switch (actuator is not operated);</li> <li>• position 2: enabling function (actuator is operated).</li> </ul> </li> <li>– for a three-position type:               <ul style="list-style-type: none"> <li>• position 1: off-function of the switch (actuator is not operated);</li> <li>• position 2: enabling function (actuator is operated in its mid position);</li> <li>• position 3: off-function (actuator is operated past its mid position);</li> <li>• when returning from position 3 to position 2, the enabling function is not activated.</li> </ul> </li> </ul>		
<b>11</b>	<b>Controlgear: location, mounting, and enclosures</b>	-	-
<b>11.1</b>	<b>General requirements</b>	-	-
	<p>All controlgear shall be located and mounted so as to facilitate:</p> <ul style="list-style-type: none"> <li>– its accessibility and maintenance;</li> <li>– its protection against the external influences or conditions under which it is intended to operate;</li> <li>– operation and maintenance of the machine and its associated equipment.</li> </ul>	Considered during design.	Pass
<b>11.2</b>	<b>Location and mounting</b>	-	-
<b>11.2.1</b>	<b>Accessibility and maintenance</b>	-	-
	<p>All items of controlgear shall be placed and oriented so that they can be identified without moving them or the wiring. For items that require checking for correct operation or that are liable to need replacement, those actions should be possible without dismantling other</p>	Comply with the requirement.	Pass

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	equipment or parts of the machine (except opening doors or removing covers, barriers or obstacles). Terminals not part of controlgear components or devices shall also conform to these requirements.		
	All controlgear shall be mounted so as to facilitate its operation and maintenance. Where a special tool is necessary to adjust, maintain, or remove a device, such a tool shall be supplied. Where access is required for regular maintenance or adjustment, the relevant devices shall be located between 0,4 m and 2,0 m above the servicing level. It is recommended that terminals be at least 0,2 m above the servicing level and be so placed that conductors and cables can be easily connected to them.	All the controlgear placed according to this clause, and they can accessibility and maintenance easily.	Pass
	No devices except devices for operating, indicating, measuring, and cooling shall be mounted on doors or on access covers of enclosures that are expected to be removed.	No device installed on the door.	Pass
	Where control devices are connected through plug-in arrangements, their association shall be made clear by type (shape), marking or reference designation, singly or in combination (see 13.4.5).	Marking provided.	Pass
	Plug-in devices that are handled during normal operation shall be provided with non-interchangeable features where the lack of such a facility can result in malfunctioning.	Non-interchangeable feature provided.	Pass
	Plug/socket combinations that are handled during normal operation shall be located and mounted so as to provide unobstructed access.	No this kind of risk.	Pass
	Test points for connection of test equipment,	No test points provided.	NA

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	where provided, shall be: <ul style="list-style-type: none"> <li>– mounted so as to provide unobstructed access;</li> <li>– clearly identified to correspond with the documentation;</li> <li>– adequately insulated;</li> <li>– sufficiently spaced.</li> </ul>		
<b>11.2.2</b>	<b>Physical separation or grouping</b>	-	-
	Non-electrical parts and devices, not directly associated with the electrical equipment, shall not be located within enclosures containing controlgear. Devices such as solenoid valves should be separated from the other electrical equipment (for example in a separate compartment).	Non-electrical parts are not directly associated with the electrical equipment.	Pass
	Control devices mounted in the same location and connected to the power circuits, or to both power and control circuits, should be grouped separately from those connected only to the control circuits.	Control devices have been grouped.	Pass
	Terminals shall be separated into groups for: <ul style="list-style-type: none"> <li>– power circuits;</li> <li>– control circuits of the machine;</li> <li>– other control circuits, fed from external sources (for example for interlocking).</li> </ul>	The terminals are grouped and separated.	Pass
	The groups may be mounted adjacently, provided that each group can be readily identified (for example by markings, by use of different sizes, by use of barriers or by colours).	Each group can be identified readily.	Pass
	When arranging the location of devices (including interconnections), the clearances and creepage distances specified for them by the supplier shall be maintained, taking into account the external influences or conditions	The clearances and creep distances are maintained.	Pass

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	of the physical environment.		
<b>11.2.3</b>	<b>Heating effects</b>	-	-
	The temperature rise inside electrical equipment enclosures shall not exceed the ambient temperature specified by the component manufacturers.	Comply with this requirement.	Pass
	Heat generating components (for example heat sinks, power resistors) shall be so located that the temperature of each component in the vicinity remains within the permitted limit.	Considered.	Pass
<b>11.3</b>	<b>Degrees of protection</b>	-	-
	The protection of controlgear against ingress of solid foreign objects and of liquids shall be adequate taking into account the external influences under which the machine is intended to operate (i.e. the location and the physical environmental conditions) and shall be sufficient against dust, coolants, lubricants and swarf.	External influences have been considered.	Pass
	Enclosures of controlgear shall provide a degree of protection of at least IP22 (see IEC 60529).	IP54	Pass
	Exception: an enclosure providing a minimum degree of protection IP22 is not required where: a) an electrical operating area provides an appropriate degree of protection against ingress of solids and liquids, or: b) removable collectors on conductor wire or conductor bar systems are used and the measures of 12.7.1 are applied.	No exception.	NA
<b>11.4</b>	<b>Enclosures, doors and openings</b>	-	-
	Enclosures shall be constructed using	Metal material of control enclosure provided to withstand the mechanical,	Pass

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	materials capable of withstanding the mechanical, electrical and thermal stresses as well as the effects of humidity and other environmental factors that are likely to be encountered in normal service.	electrical and thermal stresses.	
	Fasteners used to secure doors and covers should be of the captive type.	Captive bolt provided.	Pass
	Windows of enclosures shall be of a material suitable to withstand expected mechanical stress and chemical attack.	No window provided.	NA
	It is recommended that enclosure doors having vertical hinges be not wider than 0,9 m, with an angle of opening of at least 95°.	Comply with the requirement.	Pass
	The joints or gaskets of doors, lids, covers and enclosures shall withstand the chemical effects of the aggressive liquids, vapours, or gases used on the machine. The means provided to maintain the degree of protection of an enclosure on doors, lids and covers that require opening or removal for operation or maintenance shall: <ul style="list-style-type: none"> <li>· be securely attached to either the door/cover or the enclosure;</li> <li>· not deteriorate due to removal or replacement of the door or the cover, and so impair the degree of protection.</li> </ul>	No this kind of hazard.	NA
	Where openings in enclosures are provided (for example, for cable access), including those towards the floor or foundation or to other parts of the machine, means shall be provided to ensure the degree of protection specified for the equipment. Openings for cable entries shall be easy to re-open on site. A suitable opening may be provided in the base of enclosures within the machine so that	The degree of protection for all openings in the enclosures secured	Pass

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	moisture due to condensation can drain away.		
	There shall be no opening between enclosures containing electrical equipment and compartments containing coolant, lubricating or hydraulic fluids, or those into which oil, other liquids, or dust can penetrate. This requirement does not apply to electrical devices specifically designed to operate in oil (for example electromagnetic clutches) nor to electrical equipment in which coolants are used.	No this kind of opening.	Pass
	Where there are holes in an enclosure for mounting purposes, means may be necessary to ensure that after mounting, the holes do not impair the required protection.	Comply with the requirement.	Pass
	Equipment that, in normal or abnormal operation, can attain a surface temperature sufficient to cause a risk of fire or detrimental effect to an enclosure material shall: <ul style="list-style-type: none"> <li>– be located within an enclosure that will withstand, without risk of fire or harmful effect, such temperatures as can be generated; and</li> <li>– be mounted and located at a sufficient distance from adjacent equipment so as to allow safe dissipation of heat (see also 11.2.3); or</li> <li>– be otherwise screened by material that can withstand, without risk of fire or harmful effect, the heat emitted by the equipment.</li> </ul>	No this kind of hazard.	NA
<b>11.5</b>	<b>Access to electrical equipment</b>	-	-
	Doors in gangways and for access to electrical operating areas shall: <ul style="list-style-type: none"> <li>– be at least 0,7 m wide and 2,0 m high;</li> <li>– open outwards;</li> <li>– have a means (for example panic bolts) to</li> </ul>	No gangway provided.	NA

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	allow opening from the inside without the use of a key or tool.		
<b>12</b>	<b>Conductors and cables</b>	-	-
<b>12.1</b>	<b>General requirements</b>		
	Conductors and cables shall be selected so as to be suitable for the operating conditions (for example voltage, current, protection against electric shock, grouping of cables) and external influences (for example ambient temperature, presence of water or corrosive substances, mechanical stresses (including stresses during installation), fire hazards) that can exist.	Conductors and cables were selected suitable for the operating conditions and external influences.	Pass
	These requirements do not apply to the integral wiring of assemblies, subassemblies, and devices that are manufactured and tested in accordance with their relevant IEC standard (for example IEC 61800 series).	Not applicable.	NA
<b>12.2</b>	<b>Conductors</b>	-	-
	Conductors should be of copper. Where aluminium conductors are used, the cross-sectional area shall be at least 16 mm <sup>2</sup> .	All conductors are copper conductors.	Pass
	To ensure adequate mechanical strength, the cross-sectional area of conductors should not be less than as shown in Table 5. However, conductors with smaller cross-sectional areas or other constructions than shown in Table 5 may be used in equipment provided adequate mechanical strength is achieved by other means and proper functioning is not impaired.	The cross-sectional of conductors was bigger than stated in table 5.	NA
	Class 1 and class 2 conductors are primarily intended for use between rigid, non-moving parts where vibration is not considered to be likely to cause damage	Considered during design.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	All conductors that are subject to frequent movement (for example one movement per hour of machine operation) should have flexible stranding of class 5 or class 6.	Flexible cable provided.	Pass
<b>12.3</b>	<b>Insulation</b>	-	-
	Where the insulation of conductors and cables can constitute hazards due for example to the propagation of a fire or the emission of toxic or corrosive fumes, guidance from the cable supplier sh be sought. It is important to give special attention to the integrity of a circuit having a safety-related function.	Considered.	Pass
	The insulation of cables and conductors used, shall be suitable for a test voltage: <ul style="list-style-type: none"> <li>– not less than 2 000 V AC for a duration of 5 min for operation at voltages higher than 50 V AC or 120 V DC, or</li> <li>– not less than 500 V AC for a duration of 5 min for PELV circuits (see IEC 60364-4-41, class III equipment).</li> </ul>	Comply with the requirement.	Pass
	The mechanical strength and thickness of the insulation shall be such that the insulation cannot be damaged in operation or during laying, especially for cables pulled into ducts.	The mechanical strength and thickness of the insulation has no damage in operation or during lying.	Pass
<b>12.4</b>	<b>Current-carrying capacity in normal service</b>	-	-
	The current-carrying capacity depends on several factors, for example insulation material, number of conductors in a cable, design (sheath), methods of installation, grouping and ambient temperature.	The specifications of the conductors have been selected according to IEC 60364-5-52.	Pass
	One typical example of the current-carrying capacities for PVC insulated wiring between enclosures and individual items of equipment under steady-state conditions is given in	Comply with table 6	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	Table 6.		
<b>12.5</b>	<b>Conductor and cable voltage drop</b>	-	-
	The voltage drop from the point of supply to the load in any power circuit cable shall not exceed 5 % of the nominal voltage under normal operating conditions. In order to conform to this requirement, it can be necessary to use conductors having a larger cross-sectional area than that derived from Table 6.	The voltage drop from the point of supply to the load is less than 5%.	Pass
	In control circuits, the voltage drop shall not reduce the voltage at any device below the manufacturer's specification for that device, taking into account inrush currents.	Considered during design.	Pass
	See also 4.3.	See related clause.	Pass
	The voltage drop in components, for example overcurrent protective devices and switching devices, should be considered.	Considered during design.	Pass
<b>12.6</b>	<b>Flexible cables</b>	-	-
<b>12.6.1</b>	<b>General</b>	-	-
	Flexible cables shall have Class 5 or Class 6 conductors.	The class 6 flexible cable is provided for this equipment.	Pass
	Cables that are subjected to severe duties shall be of adequate construction to protect against: <ul style="list-style-type: none"> <li>– abrasion due to mechanical handling and dragging across rough surfaces;</li> <li>– kinking due to operation without guides;</li> <li>– stress resulting from guide rollers and forced guiding, being wound and re-wound on cable drums.</li> </ul>	No this situation.	NA
<b>12.6.2</b>	<b>Mechanical rating</b>	-	-
	The cable handling system of the machine shall be so designed to keep the tensile stress	The tensile stress for copper conductors does not exceed 15 N/ mm <sup>2</sup> .	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	of the conductors as low as is practicable during machine operations. Where copper conductors are used, the tensile stress applied to the conductors shall not exceed 15 N/mm <sup>2</sup> of the copper cross-sectional area. Where the demands of the application exceed the tensile stress limit of 15 N/mm <sup>2</sup> , cables with special construction features should be used and the allowed maximal tensile stress should be agreed with the cable manufacturer.		
	The maximum stress applied to the conductors of flexible cables with material other than copper shall be within the cable manufacturer's specification.	No this situation.	NA
<b>12.6.3</b>	<b>Current-carrying capacity of cables wound on drums</b>	-	-
	Cables to be wound on drums shall be selected with conductors having a cross-sectional area such that, when fully wound on the drum and carrying the normal service load, the maximum allowable conductor temperature is not exceeded.	No cables wound on drums.	NA
	For cables of circular cross-sectional area installed on drums, the maximum current-carrying capacity in free air should be derated in accordance with Table 7	No cables wound on drums.	NA
<b>12.7</b>	<b>Conductor wires, conductor bars and slip-ring assemblies</b>	-	-
<b>12.7.1</b>	<b>Basic protection</b>	-	-
	Conductor wires, conductor bars and slip-ring assemblies shall be installed or enclosed in such a way that, during normal access to the machine, basic protection is achieved by the application of one of the following protective	No collector wires, collector bars or slip-ring assemblies used on these machines.	NA

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	measures: <ul style="list-style-type: none"> <li>– protection by partial insulation of live parts, or where this is not practicable;</li> <li>– protection by enclosures or barriers of at least IP2X or IPXXB.</li> </ul>		
	Horizontal top surfaces of barriers or enclosures that are readily accessible shall provide a degree of protection of at least IP4X or IPXXD.	No collector wires, collector bars or slip-ring assemblies used on these machines.	NA
	Where the required degree of protection is not achieved, protection by placing live parts out of reach in combination with emergency switching off in accordance with 9.2.3.4.3 shall be applied.	No collector wires, collector bars or slip-ring assemblies used on these machines.	NA
	Conductor wires and conductor bars shall be so placed and/or protected as to: <ul style="list-style-type: none"> <li>– prevent contact, especially for unprotected conductor wires and conductor bars, with conductive items such as the cords of pull-cord switches, strain-relief devices and drive chains;</li> <li>– prevent damage from a swinging load.</li> </ul>	No collector wires, collector bars or slip-ring assemblies used on these machines.	NA
	See also 6.2.6.	No collector wires, collector bars or slip-ring assemblies used on these machines.	NA
<b>12.7.2</b>	<b>Protective conductors</b>	-	-
	Where conductor wires, conductor bars and slip-ring assemblies are installed as part of the protective bonding circuit, they shall not carry current in normal operation. Therefore, the protective conductor (PE) and the neutral conductor (N) shall each use a separate conductor wire, conductor bar or slip-ring.	No this kind of component used.	NA
	The continuity of protective conductors using sliding contacts shall be ensured by taking	No this kind of component used.	NA

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	appropriate measures (for example, duplication of the current collector, continuity monitoring).		
<b>12.7.3</b>	<b>Protective conductor current collectors</b>	-	-
	Protective conductor current collectors shall have a shape or construction so that they are not interchangeable with the other current collectors. Such current collectors shall be of the sliding contact type.	No this kind of component used.	NA
<b>12.7.4</b>	<b>Removable current collectors with a disconnecter function</b>	-	-
	Removable current collectors having a disconnecter function shall be so designed that the protective conductor circuit is interrupted only after the live conductors have been disconnected, and the continuity of the protective conductor circuit is re-established before any live conductor is reconnected (see also 8.2.3).	No this kind of component used.	NA
<b>12.7.5</b>	<b>Clearances in air</b>	-	-
	Clearances between the respective conductors, and between adjacent systems, of conductor wires, conductor bars, slip-ring assemblies and their current collectors shall be suitable for at least a rated impulse voltage of an overvoltage category III in accordance with IEC 60664-1.	No this kind of component used.	NA
<b>12.7.6</b>	<b>Creepage distances</b>	-	-
	Creepage distances between the respective conductors, between adjacent systems of conductor wires, conductor bars and slip-ring assemblies, and their current collectors shall be suitable for operation in the intended environment, for example open air, inside	No this kind of component used.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	buildings, protected by enclosures.		
	In abnormally dusty, moist or corrosive environments, the following creepage distance requirements apply: <ul style="list-style-type: none"> <li>– unprotected conductor wires, conductor bars, and slip-ring assemblies shall be equipped with insulators with a minimum creepage distance of 60 mm;</li> <li>– enclosed conductor wires, insulated multipole conductor bars and insulated individual conductor bars shall have a minimum creepage distance of 30 mm.</li> </ul>	No this kind of component used.	NA
	The manufacturer's recommendations shall be followed regarding special measures to prevent a gradual reduction in the insulation values due to unfavourable ambient conditions (for example deposits of conductive dust, chemical attack).	No this kind of component used.	NA
<b>12.7.7</b>	<b>Conductor system sectioning</b>	-	-
	Where conductor wires or conductor bars are arranged so that they can be divided into isolated sections, suitable design measures shall be employed to prevent the energization of adjacent sections by the current collectors themselves.	No this kind of component used.	NA
<b>12.7.8</b>	<b>Construction and installation of conductor wire, conductor bar systems and slip-ring assemblies</b>	-	-
	Conductor wires, conductor bars and slip-ring assemblies in power circuits shall be grouped separately from those in control circuits.	No this kind of component used.	NA
	Conductor wires, conductor bars and slip-ring assemblies, including their current collectors, shall be capable of withstanding, without damage, the mechanical forces and thermal	No this kind of component used.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	effects of short-circuit currents.		
	Removable covers for conductor wire and conductor bar systems laid underground or underfloor shall be so designed that they cannot be opened by one person without the aid of a tool.	No this kind of component used.	NA
	Where conductor bars are installed in a common metal enclosure, the individual sections of the enclosure shall be bonded together and connected to the protective bonding circuit. Metal covers of conductor bars laid underground or underfloor shall also be bonded together and connected to the protective bonding circuit.	No this kind of component used.	NA
	The protective bonding circuit shall include the covers or cover plates of metal enclosures or underfloor ducts. Where metal hinges form a part of the protective bonding circuit, their continuity shall be verified (see Clause 18).	No this kind of component used.	NA
	Conductor bar ducts that can be subject to accumulation of liquid such as oil or water shall have drainage facilities.	No this kind of component used.	NA
<b>13</b>	<b>Wiring practices</b>	-	-
<b>13.1</b>	<b>Connections and routing</b>	-	-
<b>13.1.1</b>	<b>General requirements</b>	-	-
	All connections, especially those of the protective bonding circuit, shall be secured against accidental loosening.	All connections are secured against accidental loosening.	Pass
	The means of connection shall be suitable for the cross-sectional areas and nature of the conductors being terminated.	It is in compliance with this requirement.	Pass
	The connection of two or more conductors to one terminal is permitted only in those cases where the terminal is designed for that	One conductor mounted on one single terminal except those cases where the terminal is designed for that purpose.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	purpose. However, only one protective conductor shall be connected to one terminal connecting point.		
	Soldered connections shall only be permitted where terminals are provided that are suitable for soldering.	No soldered connection is used.	NA
	Terminals on terminal blocks shall be plainly marked or labelled to correspond with the identification used in the diagrams.	Identification has been provided according to the diagrams.	Pass
	Where an incorrect electrical connection (for example, arising from replacement of devices) is identified as a source of risk that needs to be reduced and it is not practicable to reduce the possibility of incorrect connection by design measures, the conductors and/or terminations shall be identified.	The conductors and/or terminations have been identified.	Pass
	The installation of flexible conduits and cables shall be such that liquids shall drain away from the fittings.	The liquids can drain away from the fittings.	Pass
	Means of retaining conductor strands shall be provided when terminating conductors at devices or terminals that are not equipped with this facility. Solder shall not be used for that purpose.	Appropriate retaining provision for the conductor strands provided.	Pass
	Shielded conductors shall be so terminated as to prevent fraying of strands and to permit easy disconnection.	Comply with this requirement.	Pass
	Identification tags shall be legible, permanent, and appropriate for the physical environment.	Appropriate identification has been found for the conductors and terminals.	Pass
	Terminal blocks shall be mounted and wired so that the wiring does not cross over the terminals.	No any external and/or internal wiring cross over the terminals.	Pass
<b>13.1.2</b>	<b>Conductor and cable runs</b>	-	-
	Conductors and cables shall be run from	No splice or joint was found.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	terminal to terminal without splices or joints. Connections using plug/socket combinations with suitable protection against accidental disconnection are not considered to be splices or joints for the purpose of 13.1.2.		
	Exception: Where it is impracticable to provide terminals in a junction box (for example on mobile machines, on machines having long flexible cables; cable connections exceeding a length which is not practical to be supplied by the cable manufacturer on one cable drum), splices or joints may be used.	According to this clause.	Pass
	Where it is necessary to connect and disconnect cables and cable assemblies, sufficient extra length shall be provided for that purpose.	The length is sufficient.	Pass
	The terminations of cables shall be adequately supported to prevent mechanical stresses at the terminations of the conductors.	Appropriate support for terminal of cable has been provided.	Pass
	Wherever practicable, the protective conductor shall be placed close to the associated live conductors in order to decrease the impedance of the loop.	The protective conductor has been placed close to the associated live conductors.	Pass
<b>13.1.3</b>	<b>Conductors of different circuits</b>	-	-
	Conductors of different circuits may be laid side by side, may occupy the same duct (for example conduit, cable trunking system), or may be in the same multiconductor cable or in the same plug/socket combination provided that the arrangement does not impair the proper functioning of the respective circuits and: <ul style="list-style-type: none"> <li>· where those circuits operate at different voltages, the conductors are separated by suitable barriers or;</li> </ul>	The conductors are insulated for the highest voltage	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<ul style="list-style-type: none"> <li>• the conductors are insulated for the highest voltage to which any of the conductors can be subjected, for example line to line voltage for unearthed systems and phase to earth voltage for earthed systems.</li> </ul>		
<b>13.1.4</b>	<b>AC circuits – Electromagnetic effects (prevention of eddy currents)</b>	-	-
	Conductors of AC circuits installed in ferromagnetic enclosures shall be arranged so that all conductors of each circuit, including the protective conductor of each circuit, are contained in the same enclosure. Where such conductors enter a ferrous enclosure, they shall be arranged such that the conductors are not individually surrounded by ferromagnetic material.	Considered during installation.	Pass
	Single-core cables armoured with steel wire or steel tape should not be used for AC circuits.	Considered during installation.	Pass
<b>13.1.5</b>	<b>Connection between pick-up and pick-up converter of an inductive power supply system</b>	-	-
	The cable between the pick-up and the pick-up converter shall be: <ul style="list-style-type: none"> <li>– as short as practicable;</li> <li>– adequately protected against mechanical damage.</li> </ul>	Considered during installation.	Pass
<b>13.2</b>	<b>Identification of conductors</b>	-	-
<b>13.2.1</b>	<b>General requirements</b>	-	-
	Each conductor shall be identifiable at each termination in accordance with the technical documentation.	Identified according to technical documentation.	Pass
	It is recommended (for example to facilitate maintenance) that conductors be identified by number, alphanumeric, colour (either solid or	Marked according to this clause.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	with one or more stripes), or a combination of colour and numbers or alphanumeric. When numbers are used, they shall be Arabic; letters shall be Roman (either upper or lower case).		
<b>13.2.2</b>	<b>Identification of the protective conductor / protective bonding conductor</b>	-	-
	The protective conductor / protective bonding conductor shall be readily distinguishable from other conductors by shape, location, marking, or colour. When identification is by colour alone, the bicolour combination GREEN-AND-YELLOW shall be used throughout the length of the conductor. This colour identification is strictly reserved for protective conductors/protective bonding conductors.	Distinguishable by marking and color. And the colour was GREEN-ANDYELLOW.	Pass
	For insulated conductors, the bicolour combination GREEN-AND-YELLOW shall be such that on any 15 mm length, one of the colours covers at least 30 % and not more than 70 % of the surface of the conductor, the other colour covering the remainder of the surface.	Every colour covers at least 30% and not more than 70%.	Pass
	Where the protective conductor(s) can be easily identified by its shape, position, or construction (for example a braided conductor, uninsulated stranded conductor), or where the insulated conductor is not readily accessible or is part of a multicore cable, colour coding throughout its length is not necessary. However, where the conductor is not clearly visible throughout its length, the ends or accessible locations shall be clearly identified by the graphical symbol IEC	Symbol as specified in this clause has been used and GREEN-AND-YELLOW has been used for identify the protective conductor.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	60417-5019:2006-08 (see Figure 16) or with the letters PE or by the bicolour combination GREEN-AND-YELLOW.		
	Exception: Protective bonding conductors may be marked with the letters PB and/or the symbol IEC 60417-5021 (2002-10) (see Figure 17).	Noted	Pass
<b>13.2.3</b>	<b>Identification of the neutral conductor</b>	-	-
	Where a circuit includes a neutral conductor that is identified by colour alone, the colour used for this conductor shall be BLUE. In order to avoid confusion with other colours, it is recommended that an unsaturated blue be used, called here "light blue" (see 6.2.2 of IEC 60445:2010). Where the selected colour is the sole identification of the neutral conductor, that colour shall not be used for identifying any other conductor where confusion is possible.	Only colour of neutral conductor is light blue.	Pass
	Where identification by colour is used, bare conductors used as neutral conductors shall be either coloured by a stripe, 15 mm to 100 mm wide in each compartment or unit and at each accessible location, or coloured throughout their length.	No bare neutral conductor used on this machine.	NA
<b>13.2.4</b>	<b>Identification by colour</b>	-	-
	Where colour-coding is used for identification of conductors (other than the protective conductor (see 13.2.2) and the neutral conductor (see 13.2.3)), the following colours may be used: BLACK, BROWN, RED, ORANGE, YELLOW, GREEN, BLUE (including LIGHT BLUE), VIOLET, GREY, WHITE, PINK, TURQUOISE.	According to this clause.	Pass
	It is recommended that, where colour is used	The colours are used throughout the	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	for identification, the colour be used throughout the length of the conductor either by the colour of the insulation or by colour markers at regular intervals and at the ends or accessible location.	length of the conductor.	
	For safety reasons, the colour GREEN or the colour YELLOW should not be used where there is a possibility of confusion with the bicolour combination GREEN-AND-YELLOW (see 13.2.2).	No green and yellow was not used for identify except protective conductor.	Pass
	Colour identification using combinations of those colours listed above may be used provided there can be no confusion and that GREEN or YELLOW is not used except in the bicolour combination GREEN-AND-YELLOW.	Bicolour combination GREEN-AND-YELLOW only used for protective conductor..	Pass
	Where colour-coding is used for identification of conductors, it is recommended that they be colour-coded as follows: <ul style="list-style-type: none"> <li>– BLACK: AC and DC power circuits;</li> <li>– RED: AC control circuits;</li> <li>– BLUE: DC control circuits;</li> <li>– ORANGE: excepted circuits in accordance with 5.3.5.</li> </ul>	Not all the conductors colored according to the recommend color.	NA
	Exceptions to the above are permitted where insulation is not available in the colours recommended (for example in multiconductor cables).	Noted.	Pass
<b>13.3</b>	<b>Wiring inside enclosures</b>	-	-
	Conductors inside enclosures shall be supported where necessary to keep them in place. Non-metallic ducts shall be permitted only when they are made with a flame-retardant insulating material (see the IEC 60332 series).	Appropriate support provided for the panel.	Pass
	It is recommended that electrical equipment	It is in compliance with this clause.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	mounted inside enclosures be designed and constructed in such a way as to permit modification of the wiring from the front of the enclosure (see also 11.2.1). Where that is not practicable and control devices are connected from the rear of the enclosure, access doors or swingout panels shall be provided.		
	Connections to devices mounted on doors or to other movable parts shall be made using flexible conductors in accordance with 12.2 and 12.6 to allow for the frequent movement of the part. The conductors shall be anchored to the fixed part and to the movable part independently of the electrical connection (see also 8.2.3 and 11.2.1).	Flexible conductors in accordance with 12.2 and 12.6. and the conductors is anchored to the fixed part and to the movable part independently of the electrical connection	Pass
	Conductors and cables that do not run in ducts shall be adequately supported.	Conductors and cables that do not run in ducts are adequately supported.	Pass
	Terminal blocks or plug/socket combinations shall be used for control wiring that extends beyond the enclosure. For plug/socket combinations, see also 13.4.5 and 13.4.6.	Terminal blocks have been used.	Pass
	Power cables and cables of measuring circuits may be directly connected to the terminals of the devices for which the connections were intended.	It is compliance with this clause.	Pass
<b>13.4</b>	<b>Wiring outside enclosures</b>	-	-
<b>13.4.1</b>	<b>General requirements</b>	-	-
	The means of introduction of cables or ducts with their individual glands, bushings, etc., into an enclosure shall ensure that the degree of protection is not reduced (see 11.3).	The degree of protection doesn't impair.	Pass
	Conductors of a circuit shall not be distributed over different multi-core cables, conduits, cable ducting systems or cable trunking	Comply with the requirement.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	systems. This is not required where a number of multi-core cables, forming one circuit, are installed in parallel. Where multi-core cables are installed in parallel, each cable shall contain one conductor of each phase and the neutral if any.		
<b>13.4.2</b>	<b>External ducts</b>	-	-
	Conductors and their connections external to the electrical equipment enclosure(s) shall be enclosed in suitable ducts (i.e. conduit or cable trunking systems) as described in 13.5 except for suitably protected cables that may be installed without ducts and with or without the use of cable trays or cable support means. Where devices such as position switches or proximity switches are supplied with a dedicated cable, their cable need not be enclosed in a duct when the cable is suitable for the purpose, sufficiently short, and so located or protected, that the risk of damage is minimized.	Wiring protected by conduits.	Pass
	Fittings used with ducts or cables shall be suitable for the physical environment.	Suitable for the physical environment.	Pass
	Flexible conduit or flexible multiconductor cable shall be used where it is necessary to employ flexible connections to pendant push-button stations. The weight of the pendant stations shall be supported by means other than the flexible conduit or the flexible multiconductor cable, except where the conduit or cable is specifically designed for that purpose.	Comply with this requirement.	Pass
<b>13.4.3</b>	<b>Connection to moving elements of the machine</b>	-	-
	The design of connections to moving parts	See related clause.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	shall take into account the foreseeable frequency of movement and shall be made using conductors in accordance with 12.2 and 12.6. Flexible cable and flexible conduit shall be so installed as to avoid excessive flexing and straining, particularly at the fittings.		
	Cables subject to movement shall be supported in such a way that there is no mechanical strain on the connection points nor any sharp flexing. When this is achieved by the provision of a loop, it shall have sufficient length to provide for a bending radius of the cable as specified by the cable manufacturer or if no such specification is given, at least 10 times the diameter of the cable.	Comply with this requirement.	Pass
	Flexible cables of machines shall be so installed or protected as to minimize the possibility of external damage due to factors that include the following cable use or potential abuse: <ul style="list-style-type: none"> <li>– being run over by the machine itself;</li> <li>– being run over by vehicles or other machines;</li> <li>– coming into contact with the machine structure during movements;</li> <li>– running in and out of cable baskets, or on or off cable drums;</li> <li>– acceleration forces and wind forces on festoon systems or suspended cables;</li> <li>– excessive rubbing by cable collector;</li> <li>– exposure to excessive radiated heat.</li> </ul>	See related clause.	Pass
	The cable sheath shall be resistant to the normal wear that can be expected from movement and to the effects of environmental	See related clause.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	contaminants (for example oil, water, coolants, dust).		
	Where cables subject to movement are close to moving parts, precautions shall be taken to maintain a space of at least 25 mm between the moving parts and the cables. Where that distance is not practicable, fixed barriers shall be provided between the cables and the moving parts.	See related clause.	Pass
	The cable handling system shall be so designed that lateral cable angles do not exceed 5°, avoiding torsion in the cable when: <ul style="list-style-type: none"> <li>– being wound on and off cable drums; and</li> <li>– approaching and leaving cable guidance devices.</li> </ul>	See related clause.	Pass
	Measures shall be taken to ensure that at least two turns of flexible cables always remain on a drum.	Not applicable.	NA
	Devices serving to guide and carry a flexible cable shall be so designed that the inner bending radius at all points where the cable is bent is not less than the values given in Table 8, unless otherwise agreed with the cable manufacturer, taking into account the permissible tension and the expected fatigue life.	See related clause.	Pass
	The straight section between two bends shall be at least 20 times the diameter of the cable.	See related clause.	Pass
	Where flexible conduit is adjacent to moving parts, the construction and supporting means shall prevent damage to the flexible conduit under all conditions of operation.	Considered during installation.	Pass
	Flexible conduit shall not be used for connections subject to rapid or frequent movements except when specifically	Not used.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	designed for that purpose.		
<b>13.4.4</b>	<b>Interconnection of devices on the machine</b>	-	-
	Where several machine-mounted devices (for example position sensors, push-buttons) are connected in series or in parallel, it is recommended that the connections between those devices be made through terminals forming intermediate test points. Such terminals shall be conveniently placed, adequately protected, and shown on the relevant diagrams.	Not applicable.	NA
<b>13.4.5</b>	<b>Plug/socket combinations</b>	-	-
	Components or devices inside an enclosure, terminated by fixed plug/socket combinations (no flexible cable), or components connected to a bus system by a plug/socket combination, are not considered to be plug/socket combinations for the purpose of this 13.4.5.	Noted.	Pass
	After installation in accordance with item a) below, plug/socket combinations shall be of such a type as to prevent unintentional contact with live parts at any time, including during insertion or removal of the connectors. The degree of protection shall be at least IP2X or IPXXB. PELV circuits are excepted from this requirement.	Considered.	Pass
	Where the plug/socket contains a contact for the protective bonding circuit, it shall have a first make last break contact (see also 8.2.4).	Comply with the requirement.	Pass
	Plug/socket combinations intended to be connected or disconnected during load conditions shall have sufficient load-breaking capacity. Where the plug/socket combination is rated at 30 A, or greater, it shall be interlocked with a switching device so that the	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	connection and disconnection is possible only when the switching device is in the OFF position.		
	Plug/socket combinations that are rated at more than 16 A shall have a retaining means to prevent unintended or accidental disconnection	Not applicable.	NA
	Where an unintended or accidental disconnection of plug/socket combinations can cause a hazardous situation, they shall have a retaining means.	No hazardous situation.	NA
	<p>The installation of plug/socket combinations shall fulfil the following requirements as applicable:</p> <p>a) The component which remains live after disconnection shall have a degree of protection of at least IP2X or IPXXB, taking into account the required clearance and creepage distances. PELV circuits are excepted from this requirement.</p> <p>b) Metallic housings of plug/socket combinations shall be connected to the protective bonding circuit.</p> <p>c) Plug/socket combinations intended to carry power loads but not to be disconnected during load conditions shall have a retaining means to prevent unintended or accidental disconnection and shall be clearly marked that they are not intended to be disconnected under load.</p> <p>d) Where more than one plug/socket combination is provided in the same electrical equipment, the associated combinations shall be clearly identifiable. It is recommended that mechanical coding be used to prevent</p>	Installation according to the clause.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	incorrect insertion. e) Plug/socket combinations used in control circuits shall fulfil the applicable requirements of IEC 61984.		
	Exception: In plug/socket combinations in accordance with IEC 60309-1, only those contacts shall be used for control circuits which are intended for those purposes. This exception does not apply to control circuits using high frequency signals superimposed on the power circuits.	Not applicable.	NA
<b>13.4.6</b>	<b>Dismantling for shipment</b>	-	-
	Where it is necessary that wiring be disconnected for shipment, terminals or plug/socket combinations shall be provided at the sectional points. Such terminals shall be suitably enclosed and plug/socket combinations shall be protected from the physical environment during transportation and storage.	Not applicable.	NA
<b>13.4.7</b>	<b>Additional conductors</b>	-	-
	Consideration should be given to providing additional conductors for maintenance or repair. When spare conductors are provided, they shall be connected to spare terminals or isolated in such a manner as to prevent contact with live parts.	No spare conductor need for maintenance or repair.	NA
<b>13.5</b>	<b>Ducts, connection boxes and other boxes</b>	-	-
<b>13.5.1</b>	<b>General requirements</b>	-	-
	Ducts shall provide a degree of protection (see IEC 60529) suitable for the application.	According to IEC 60529	Pass
	All sharp edges, flash, burrs, rough surfaces, or threads with which the insulation of the conductors can come in contact shall be	Comply with the requirement.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	removed from ducts and fittings. Where necessary, additional protection consisting of a flame-retardant, oil-resistant insulating material shall be provided to protect conductor insulation.		
	Drain holes of 6 mm diameter are permitted in cable trunking systems, connection boxes, and other boxes used for wiring purposes that can be subject to accumulations of oil or moisture.	No this kind of risk.	NA
	In order to prevent confusion of conduits with oil, air, or water piping, it is recommended that the conduits be either physically separated or suitably identified.	Not applicable	NA
	Ducts and cable trays shall be rigidly supported and positioned at a sufficient distance from moving parts and in such a manner so as to minimize the possibility of damage or wear. In areas where human passage is required, the ducts and cable trays shall be mounted at least 2 m above the working surface.	The distance is sufficient.	Pass
	Cable trays that are partially covered should not be considered to be ducts or cable trunking systems (see 13.5.6), and the cables used shall be of a type suitable for installation on open cable trays.	No cable tray and cable trucking system used.	NA
	It is recommended that the dimensions and arrangement of ducts be such as to facilitate the insertion of the conductors and cables.	Considered during installation.	Pass
<b>13.5.2</b>	<b>Rigid metal conduit and fittings</b>	-	-
	Rigid metal conduit and fittings shall be of galvanized steel or of a corrosion-resistant material suitable for the conditions. Where galvanic action is possible between dissimilar	No Rigid metal conduit and fittings provided.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	metals metal these combinations shall not be used.		
	Conduits shall be securely held in place and supported at each end.	See above	NA
	Fittings shall be compatible with the conduit and appropriate for the application. Fittings should be threaded unless structural difficulties prevent assembly. Where threadless fittings are used, the conduit shall be securely fastened to the equipment.	See above	NA
	Conduit bends shall be made in such a manner that the conduit shall not be damaged and the internal diameter of the conduit shall not be effectively reduced.	See above	NA
<b>13.5.3</b>	<b>Flexible metal conduit and fittings</b>	-	-
	A flexible metal conduit shall consist of a flexible metal tubing or woven wire armour. It shall be suitable for the expected physical environment.	No this kind of situation.	NA
	Fittings shall be compatible with the conduit and appropriate for the application.	See above	NA
<b>13.5.4</b>	<b>Flexible non-metallic conduit and fittings</b>	-	-
	Flexible non-metallic conduit shall be resistant to kinking and shall have physical characteristics similar to those of the sheath of multiconductor cables.	Comply with the requirement.	Pass
	The conduit shall be suitable for use in the expected physical environment.	Comply with the requirement.	Pass
	Fittings shall be compatible with the conduit and appropriate for the application.	Comply with the requirement.	Pass
<b>13.5.5</b>	<b>Cable trunking systems</b>	-	-
	Cable trunking systems external to enclosures shall be rigidly supported and clear of all moving parts of the machine and of sources of	No any cable trunking system provided for this machine.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	contamination.		
	Covers shall be shaped to overlap the sides; gaskets shall be permitted. Covers shall be attached to cable trunking systems by suitable means. On horizontal cable trunking systems, the cover shall not be on the bottom unless specifically designed for such installation.	See above	NA
	Where the cable trunking system is furnished in sections, the joints between sections shall fit tightly but need not be gasketed.	See above	NA
	The only openings permitted shall be those required for wiring or for drainage. Cable trunking systems shall not have opened but unused knockouts.	See above	NA
<b>13.5.6</b>	<b>Machine compartments and cable trunking systems</b>	-	-
	The use of compartments or cable trunking systems within the column or base of a machine to enclose conductors is permitted provided the compartments or cable trunking systems are isolated from coolant or oil reservoirs and are entirely enclosed. Conductors run in enclosed compartments and cable trunking systems shall be so secured and arranged that they are not subject to damage.	Not applicable	NA
<b>13.5.7</b>	<b>Connection boxes and other boxes</b>	-	-
	Connection boxes and other boxes used for wiring purposes shall be accessible for maintenance. Those boxes shall provide protection against the ingress of solid bodies and liquids, taking into account the external influences under which the machine is intended to operate (see 11.3).	Motor connection boxes provided. All of them are accessible.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	Those boxes shall not have opened but unused knockouts nor any other openings and shall be so constructed as to exclude materials such as dust, flyings, oil, and coolant.	Covers of the boxes overlap and thus prevent from ingress of liquids.	Pass
<b>13.5.8</b>	<b>Motor connection boxes</b>	-	-
	Motor connection boxes shall enclose only connections to the motor and motor-mounted devices (for example brakes, temperature sensors, plugging switches, tachometer generators).	The requirement has been complied with.	Pass
<b>14</b>	<b>Electric motors and associated equipment</b>	-	-
<b>14.1</b>	<b>General requirements</b>	-	-
	Electric motors should conform to the relevant parts of IEC 60034 series.	Comply with EN 60034 series with equate to IEC 60034 series standard, see CE certificate of the motor.	Pass
	The protection requirements for motors and associated equipment are given in 7.2 for overcurrent protection, in 7.3 for protection of motors against overheating, and in 7.6 for overspeed protection.	See the related clause.	Pass
	As many controllers do not switch off the supply to a motor when it is at rest, care shall be taken to ensure compliance with the requirements of 5.3, 5.4, 5.5, 7.5, 7.6 and 9.4. Motor control equipment shall be located and mounted in accordance with Clause 11.	See the related clause.	Pass
<b>14.2</b>	<b>Motor enclosures</b>	-	-
	Enclosures for motors should be in accordance with IEC 60034-5.	According to IEC 60034-5	Pass
	The degree of protection shall be dependent on the application and the physical environment (see 4.4). All motors shall be adequately protected from mechanical	At least IP23	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	damage.		
<b>14.3</b>	<b>Motor dimensions</b>	-	-
	As far as is practicable, the dimensions of motors shall conform to those given in the IEC 60072 series.	Conform to IEC 60072 series.	Pass
<b>14.4</b>	<b>Motor mounting and compartments</b>	-	-
	Each motor and its associated couplings, belts, pulleys, or chains, shall be so mounted that they are adequately protected and are easily accessible for inspection, maintenance, adjustment and alignment, lubrication, and replacement. The motor mounting arrangement shall be such that all motor mounting means can be removed and all terminal boxes are accessible.	They are adequately protected and can access easily.	Pass
	Motors shall be so mounted that proper cooling is ensured and the temperature rise remains within the limits of the insulation class (see IEC 60034-1).	Appropriate cooling has been used when mount the motor	Pass
	Where practicable, motor compartments should be clean and dry, and when required, shall be ventilated directly to the exterior of the machine. The vents shall be such that ingress of swarf, dust, or water spray is at an acceptable level.	They are clean and dry.	Pass
	There shall be no opening between the motor compartment and any other compartment that does not meet the motor compartment requirements. Where a conduit or pipe is run into the motor compartment from another compartment not meeting the motor compartment requirements, any clearance around the conduit or pipe shall be sealed.	No opening.	Pass
<b>14.5</b>	<b>Criteria for motor selection</b>	-	-

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<p>The characteristics of motors and associated equipment shall be selected in accordance with the anticipated service and physical environmental conditions (see 4.4). In this respect, the points that shall be considered include:</p> <ul style="list-style-type: none"> <li>– type of motor;</li> <li>– type of duty cycle (see IEC 60034-1);</li> <li>– fixed speed or variable speed operation, (and the consequent variable influence of the ventilation);</li> <li>– mechanical vibration;</li> <li>– type of motor control;</li> <li>– temperature rise and other effects of the frequency spectrum of the voltage and/or current feeding the motor (particularly when it is supplied from a converter);</li> <li>– method of starting and the possible influence of the inrush current on the operation of other users of the same power supply, taking also into account possible special considerations stipulated by the supply authority;</li> <li>– variation of counter-torque load with time and speed;</li> <li>– influence of loads with large inertia;</li> <li>– influence of constant torque or constant power operation;</li> <li>– possible need of inductive reactors between motor and converter.</li> </ul>	Considered during design.	Pass
<b>14.6</b>	<b>Protective devices for mechanical brakes</b>	-	-
	Operation of the overload and overcurrent protective devices for mechanical brake actuators shall initiate the simultaneous de-energization (release) of the associated	No this kind of equipment.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	machine actuators.		
<b>15</b>	<b>Socket-outlets and lighting</b>	-	-
<b>15.1</b>	<b>Socket-outlets for accessories</b>	-	-
	<p>Where the machine or its associated equipment is provided with socket-outlets that are intended to be used for accessory equipment (for example hand-held power tools, test equipment), the following apply:</p> <ul style="list-style-type: none"> <li>– the socket-outlets should conform to IEC 60309-1. Where that is not practicable, they should be clearly marked with the voltage and current ratings;</li> <li>– the continuity of the protective bonding circuit to the socket-outlet shall be ensured;</li> <li>– all unearthed conductors connected to the socket-outlet shall be protected against overcurrent and, when required, against overload in accordance with 7.2 and 7.3 separately from the protection of other circuits;</li> <li>– where the power supply to the socket-outlet is not disconnected by the supply disconnecting device for the machine or the section of the machine, the requirements of 5.3.5 apply;</li> <li>– where fault protection is provided by automatic disconnection of supply, the disconnection time shall be in accordance with Table A.1 for TN systems or Table A.2 for TT systems;</li> <li>– circuits supplying socket-outlets with a current rating not exceeding 20 A shall be provided with residual current protection (RCDs) with a rated operating current not exceeding 30 mA.</li> </ul>	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
<b>15.2</b>	<b>Local lighting of the machine and of the equipment</b>	-	-
<b>15.2.1</b>	<b>General</b>	-	-
	The ON/OFF switch shall not be incorporated in the lampholder or in the flexible connecting cord.	Not provided for this machine.	NA
	Stroboscopic effects from lights shall be avoided by the selection of appropriate luminaires.	Not provided for this machine.	NA
	Where fixed lighting is provided in an enclosure, electromagnetic compatibility should be taken into account using the principles outlined in 4.4.2.	Not provided for this machine.	NA
<b>15.2.2</b>	<b>Supply</b>		
	The nominal voltage of the local lighting circuit shall not exceed 250 V between conductors. A voltage not exceeding 50 V between conductors is recommended.	Not applicable.	NA
	Lighting circuits shall be supplied from one of the following sources (see also 7.2.6): <ul style="list-style-type: none"> <li>– a dedicated isolating transformer connected to the load side of the supply disconnecting device. Overcurrent protection shall be provided in the secondary circuit;</li> <li>– a dedicated isolating transformer connected to the line side of the supply disconnecting device. That source shall be permitted for maintenance lighting circuits in control enclosures only. Overcurrent protection shall be provided in the secondary circuit (see also 5.3.5);</li> <li>– a circuit of the electrical equipment of the machine for lighting, with dedicated overcurrent protection;</li> <li>– an isolating transformer connected to the</li> </ul>	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<p>line side of the supply disconnecting device, provided with a dedicated primary disconnecting means (see 5.3.5) and secondary overcurrent protection, and mounted within the control enclosure adjacent to the supply disconnecting device;</p> <ul style="list-style-type: none"> <li>– an externally supplied lighting circuit (for example factory lighting supply). This shall be permitted in control enclosures only, and for the machine work light(s) where their total power rating is not more than 3 kW;</li> <li>– power supply units, for DC supply to LED light sources, fitted with isolating transformers (for example, in accordance with IEC 61558-2-6).</li> </ul>		
	Exception: where fixed lighting is out of reach of operators during normal operations, the provisions of 15.2.2 do not apply.	Not applicable.	NA
<b>15.2.3</b>	<b>Protection</b>	-	-
	Local lighting circuits shall be protected in accordance with 7.2.6.	Not applicable.	NA
<b>15.2.4</b>	<b>Fittings</b>	-	-
	Adjustable lighting fittings shall be suitable for the physical environment	Not applicable.	NA
	<p>The lampholders shall be:</p> <ul style="list-style-type: none"> <li>– in accordance with the relevant IEC standard;</li> <li>– constructed with an insulating material protecting the lamp cap so as to prevent unintentional contact.</li> </ul>	Not applicable.	NA
	Reflectors shall be supported by a bracket and not by the lampholder.	Not applicable.	NA
	Exception: where fixed lighting is out of reach of operators during normal operation, the	Not applicable.	NA

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	provisions of 15.2.4 do not apply.		
<b>16</b>	<b>Marking, warning signs and reference designations</b>	-	-
<b>16.1</b>	<b>General</b>	-	-
	Warning signs, nameplates, markings, labels and identification plates shall be of sufficient durability to withstand the physical environment involved. The markings shall be sufficiently durable to remain legible for the foreseen lifetime of the machine.	The durability of marking has been tested, and they can withstand the physical environment	Pass
<b>16.2</b>	<b>Warning signs</b>	-	-
<b>16.2.1</b>	<b>Electric shock hazard</b>	-	-
	Enclosures that do not otherwise clearly show that they contain electrical equipment that can give rise to a risk of electric shock shall be marked with the graphical symbol ISO 7010-W012 (see Figure 18).	Marked.	Pass
	The warning sign shall be plainly visible on the enclosure door or cover.	Marked.	Pass
	The warning sign may be omitted (see also 6.2.2 b)) for: <ul style="list-style-type: none"> <li>– an enclosure equipped with a supply disconnecting device;</li> <li>– an operator-machine interface or control station;</li> <li>– a single device with its own enclosure (for example position sensor).</li> </ul>	Noted.	Pass
<b>16.2.2</b>	<b>Hot surfaces hazard</b>	-	-
	Where the risk assessment shows the need to warn against the possibility of hazardous surface temperatures of the electrical equipment, the graphical symbol ISO 7010-W017 shall be used (see Figure 19).	No such kind of hazardous exist.	NA
<b>16.3</b>	<b>Functional identification</b>	-	-

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	Control devices and visual indicators shall be clearly and durably marked with regard to their functions either on or adjacent to the item. It is recommended that such markings are made in accordance with IEC 60417 and ISO 7000.	Appropriate marking have been provided. The symbols referred to IEC 60417 and/or ISO-7000 have been used	Pass
<b>16.4</b>	<b>Marking of enclosures of electrical equipment</b>	-	-
	The following information shall be legibly and durably marked in a way that is plainly visible after the equipment is installed on enclosures that receive incoming power supplies: <ul style="list-style-type: none"> <li>· name or trade mark of supplier;</li> <li>· type designation or model, where applicable;</li> <li>· serial number where applicable;</li> <li>· main document number (see IEC 62023) where applicable;</li> <li>· rated voltage, number of phases and frequency (if AC), and full-load current for each incoming supply.</li> </ul>		
	It is recommended that this information is provided adjacent to the main incoming supply(ies).	Noted	Pass
<b>16.5</b>	<b>Reference designations</b>	-	-
	All enclosures, assemblies, control devices, and components shall be plainly identified with the same reference designation as shown in the technical documentation.	Comply with the requirement.	Pass
<b>17</b>	<b>Technical documentation</b>	-	-
<b>17.1</b>	<b>General</b>	-	-
	The information necessary for identification, transport, installation, use, maintenance, decommissioning and disposal of the electrical equipment shall be supplied.	Electrical circuit diagrams, component part list, as well as the installation instruction have been provided.	Pass
	Annex I should be considered as guidance for	Prepared according to annex 1.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	the preparation of information and documents.		
<b>17.2</b>	<b>Information related to the electrical equipment</b>	-	-
	The following shall be supplied:	See below	Pass
	a) where more than one document is provided, a main document for the electrical equipment as a whole, listing the complementary documents associated with the electrical equipment;	The sufficient information for the electric control system has been provided. See instruction manual and related document.	Pass
	b) identification of the electrical equipment (see 16.4);	The sufficient information for the electric control system has been provided. See instruction manual and related document.	Pass
	c) information on installation and mounting including: <ul style="list-style-type: none"> <li>• a description of the electrical equipment's installation and mounting, and its connection to the electrical supplies and where relevant other supplies;</li> <li>• short-circuit current rating of the electrical equipment for each incoming power supply;</li> <li>• rated voltage, number of phases and frequency (if AC.), type of distribution system (TT, TN, IT) and full-load current for each incoming supply;</li> <li>• any additional electrical supply(ies) requirements (for example maximum supply source impedance, leakage current) for each incoming supply;</li> <li>• space required for the removal or servicing of the electrical equipment;</li> <li>• installation requirements where needed to ensure that the arrangements for cooling are not impaired;</li> <li>• environmental limitations (for example</li> </ul>	The sufficient information for the electric control system has been provided. See instruction manual and related document.	Pass

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Clause	Requirement - test	Result	Verdict
	lighting, vibration, EMC environment, atmospheric contaminants) where appropriate; <ul style="list-style-type: none"> <li>• functional limitations (for example peak starting currents and permitted voltage drop(s)) as applicable;</li> <li>• precautions to be taken for the installation of the electrical equipment relevant to the electromagnetic compatibility;</li> </ul>		
	d) an instruction for the connection of simultaneously accessible extraneous-conductive parts in the vicinity of the machine (for example, within 2,5 metres) such as the following to the protective bonding circuit: <ul style="list-style-type: none"> <li>• metallic pipes;</li> <li>• fences;</li> <li>• ladders;</li> <li>• handrails.</li> </ul>		
	e) information on the functioning and operation, including as applicable: <ul style="list-style-type: none"> <li>• an overview of the structure of the electrical equipment (for example by structure diagram or overview diagram);</li> <li>• procedures for programming or configuring, as necessary for the intended use;</li> <li>• procedures for restarting after an unexpected stop;</li> <li>• a sequence of operation;</li> </ul>	The sufficient information for the electric control system has been provided. See instruction manual and related document.	Pass
	f) information on maintenance of the electrical equipment, as appropriate, including: <ul style="list-style-type: none"> <li>• frequency and method of functional testing;</li> <li>• instructions on the procedures for safe maintenance and where it is necessary to suspend a safety function and/or protective</li> </ul>	The sufficient information for the electric control system has been provided. See instruction manual and related document.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	measure (see 9.3.6); <ul style="list-style-type: none"> <li>• guidance on the adjustment, repair, and frequency and method of preventive maintenance;</li> <li>• details of the interconnections of the electrical components subject to replacement (for example by circuit diagrams and/or connection tables);</li> <li>• information on required special devices or tools;</li> <li>• information on spare parts;</li> <li>• information on possible residual risks, indication of whether any particular training is required and specification of any necessary personal protective equipment;</li> <li>• where applicable, instructions to restrict availability of key(s) or tool(s) to skilled or instructed persons only;</li> <li>• settings (DIP-switches, programmable parameter values, etc);</li> <li>• information for validation of safety related control functions after repair or modification, and for periodic testing where necessary;</li> </ul>		
	g) information on handling, transportation and storage as appropriate (for example dimensions, weight, environmental conditions, possible ageing constraints);	The sufficient information for the electric control system has been provided. See instruction manual and related document.	Pass
	h) information for proper disassembly and handling of components (for example for recycling or disposal).	The sufficient information for the electric control system has been provided. See instruction manual and related document.	Pass
<b>18</b>	<b>Verification</b>	-	-
<b>18.1</b>	<b>General</b>	-	-
	The extent of verification will be given in the dedicated product standard for a particular	Appropriate verification has been carried out. And the result is acceptable.	Pass

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	<p>machine. Where there is no dedicated product standard for the machine, the verifications shall always include the items a), b), c) and h) and may include one or more of the items d) to g):</p> <p>a) verification that the electrical equipment complies with its technical documentation;</p> <p>b) verification of continuity of the protective bonding circuit (Test 1 of 18.2.2);</p> <p>c) in case of fault protection by automatic disconnection of supply, conditions for protection by automatic disconnection shall be verified according to 18.2;</p> <p>d) insulation resistance test (see 18.3);</p> <p>e) voltage test (see 18.4);</p> <p>f) protection against residual voltage (see 18.5);</p> <p>g) verification that the relevant requirements of 8.2.6 are met;</p> <p>h) functional tests (see 18.6).</p>		
	When these tests are performed, it is recommended that they follow the sequence listed above. Where the sequence cannot be followed verification a) and b) shall be conducted first.	Appropriate test has been carried out. And the result is acceptable.	Pass
	When the electrical equipment is modified, the requirements stated in 18.7 shall apply.	Not applicable.	NA
	For verifications that include measurement, measuring equipment in accordance with the IEC 61557 series is recommended.	Comply with IEC 61557 series.	Pass
	The results of the verification shall be documented.	See test report.	Pass
<b>18.2</b>	<b>Verification of conditions for protection by automatic disconnection of supply</b>	-	-
<b>18.2.1</b>	<b>General</b>	-	-

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<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	The conditions for automatic disconnection of supply (see 6.3.3) shall be verified by tests.	Verified.	Pass
	Test 1 verifies the continuity of the protective bonding circuit.	Verified.	Pass
	Test 2 verifies the conditions for protection by automatic disconnection of the supply in TN systems.	By end user	NA
	For TN-systems, those test methods are described in 18.2.2 and 18.2.3; their application for different conditions of supply are specified in 18.2.4.	TN system.	Pass
	For TT systems, see Clause A.2.	Not applicable.	NA
	For IT systems, see IEC 60364-6.	Not applicable.	NA
	Where RCDs are used in the electrical equipment, their function shall be verified in accordance with the manufacturer's instructions. The test procedure and test interval shall be specified in the maintenance instructions.	Not applicable.	NA
<b>18.2.2</b>	<b>Test 1</b> – <b>Verification of the continuity of the protective bonding circuit</b>	-	-
	The resistance between the PE terminal (see 5.2 and Figure 4) and relevant points that are part of the protective bonding circuit shall be measured with a current between at least 0,2 A and approximately 10 A derived from an electrically separated supply source (for example SELV, see 414 of IEC 60364-4-41:2005) having a maximum no-load voltage of 24 V AC or DC.	Tested, see test report.	Pass
	The resistance measured shall be in the expected range according to the length, the cross sectional area and the material of the	Tested, see test report.	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	related protective conductors and protective bonding conductor(s).		
	Earthed PELV supplies can produce misleading results in this test and therefore shall not be used.	Considered.	Pass
<b>18.2.3</b>	<b>Test 2</b> – <b>Fault loop impedance verification and suitability of the associated overcurrent protective device</b>	-	-
	The connections of each power supply including the connection of the associated protective conductor to the PE terminal of the machine, shall be verified by inspection.	Not applicable.	NA
	The conditions for the protection by automatic disconnection of supply in accordance with 6.3.3 and Annex A shall be verified by both:	Not applicable.	NA
	a) verification of the fault loop impedance by: – calculation, or – measurement in accordance with A.1.4, and	Not applicable.	NA
	b) confirmation that the setting and characteristics of the associated overcurrent protective device are in accordance with the requirements of Annex A, and where a power drive system (PDS) is used, confirmation that the setting and characteristics of the protective device(s) associated with a PDS are in accordance with the converter manufacturer's and protective device manufacturer's instructions.	Not applicable.	NA
<b>18.2.4</b>	<b>Application of the test methods for TN-systems</b>	-	-
	When Test 2 of 18.2.3 is carried out by measurement, it shall always be preceded by	tested	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	Test 1 of 18.2.2.		
	The tests that are necessary for machines of different status are specified in Table 9.	Tested according table 9	Pass
<b>18.3</b>	<b>Insulation resistance tests</b>	-	-
	When insulation resistance tests are performed, the insulation resistance measured at 500 V DC between the power circuit conductors and the protective bonding circuit shall be not less than 1 M $\Omega$ . The test may be made on individual sections of the complete electrical installation.	See test report.	Pass
	Exception: for certain parts of electrical equipment, incorporating for example busbars, conductor wire or conductor bar systems or slip-ring assemblies, a lower minimum value is permitted, but that value shall not be less than 50 k $\Omega$ .	Not applicable.	NA
	If the electrical equipment of the machine contains surge protection devices which are likely to operate during the test, it is permitted to either: <ul style="list-style-type: none"> <li>- disconnect these devices, or</li> <li>- reduce the test voltage to a value lower than the voltage protection level of the surge protection devices, but not lower than the peak value of the upper limit of the supply (phase to neutral) voltage.</li> </ul>	Not applicable.	NA
<b>18.4</b>	<b>Voltage tests</b>	-	-
	When voltage tests are performed, tests and test equipment shall be in accordance with EN 61180.	Tested according to EN 61180	Pass
	The test voltage shall be at a nominal frequency of 50 Hz or 60 Hz.	50Hz	Pass
	The maximum test voltage shall have a value	1000V, 1s	Pass

<b>EN 60204-1:2018</b>			
<b>Clause</b>	<b>Requirement - test</b>	<b>Result</b>	<b>Verdict</b>
	of twice the rated supply voltage of the equipment or 1 000 V, whichever is the greater. The maximum test voltage shall be applied between the power circuit conductors and the protective bonding circuit for at least 1 s. The requirements are satisfied if no disruptive discharge occurs.		
	Components and devices that are not rated to withstand the test voltage and surge protection devices which are likely to operate during the test shall be disconnected during testing.	Disconnected	Pass
	Components and devices that have been voltage tested in accordance with their product standards may be disconnected during testing.	Considered.	Pass
<b>18.5</b>	<b>Protection against residual voltages</b>	-	-
	Where appropriate, tests shall be performed to ensure compliance with 6.2.4.	No need.	NA
<b>18.6</b>	<b>Functional tests</b>	-	-
	The functions of electrical equipment shall be tested.	Tested	Pass
<b>18.7</b>	<b>Retesting</b>	-	-
	Where a portion of the machine or its associated equipment is changed or modified, the need for re-verification and testing of the electrical equipment shall be considered.	Not applicable.	NA
	Particular attention should be given to the possible adverse effects that retesting can have on the equipment (for example overstressing of insulation, disconnection/reconnection of devices).	No retesting required.	NA

Annex A  
The EN 60204-1 test report

# EN60204-1 Test Report

Manufacturer: Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd.  
EUT Plastic Sheet&Plate&Film Extrusion Line  
Model JWZN80  
Test Equipment Withstand Voltage Tester: ZC25/3  
Insulation Resistance Tester: ZC25/4  
Grounding Tester: JD-8  
Test conditions 10A/50HZ  
According to: Chapter 52 and 53 of EN 60204-1  
Date: March 29, 2023

## 1. Continuity of the protective bonding circuit

Test Points	Test Result(m $\Omega$ )	Test Current(A)	Voltage Drop(V)
PE-Control Panel	73	10	0.73
PE-Electrical Box	69	10	0.69
PE-Motor1	80	10	0.80
Transformer1	66	10	0.66

## 2. Insulation Resistance

Test Points	Test Result(M $\Omega$ )
PE-Power Inlet	251
PE-Motor1	270
Transformer1	294

## 3. Withstanding Voltage

Test Points	Breakdown
PE-Power Inlet	No
PE-Motor1	No
Transformer1	No

### 3.3 Airborne noise test report

# Noise Test Report

Manufacturer	Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd.		
EUT	Plastic Sheet&Plate&Film Extrusion Line		
Model	JWZN80	Date	March 29, 2023
Test Condition	Running Free		
Test Equipment	Digital Sound Level Meter Type Test 1350A Manufacturer: TES Electronic Industrial Co., LTD.		

Give as “dB (A)” unit, A-Weighted

	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Average
Position 1	69	68	68	67	68	68
Position 2	67	68	69	68	67	67.8
Position 3	68	69	68	67	69	68.2
Position 4	69	68	67	68	68	68
Average of 1 to 4						68

Manufacturer	Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd.		
EUT	Plastic Sheet&Plate&Film Extrusion Line		
Model	JWZN80	Date	March 29, 2023
Test Condition	At normal working		
Test Equipment	Digital Sound Level Meter Type Test 1350A Manufacturer: TES Electronic Industrial Co., LTD.		

Give as “dB (A)” unit, A-Weighted

	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Average
Position 1	82	81	82	83	82	82
Position 2	83	82	82	81	83	82.2
Position 3	81	82	83	83	81	82
Position 4	82	83	81	82	81	81.8
Average of 1 to 4						82

## **Annex: Technical Information**

A.1 Declaration of conformity with signature

A.2 Specifications table

A.3 Safety Pictures

A.4 Mechanical drawing

A.5 Electrical system

A.6 Instruction manual

## A.1 Declaration of conformity with signature

# EC - DECLARATION OF CONFORMITY



## COMPANY INFORMATION

**Name** : Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd  
**Address** : West Ofthe Intersecuon Of Tongling Road And Hangzhou Road,Chuzhou City,Anhui Province, P.R China.  
**Phone / Fax** : +86 0550-3169988

## MANUFACTURER INFORMATION

**Name** : Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd  
**Address** : West Ofthe Intersecuon Of Tongling Road And Hangzhou Road,Chuzhou City,Anhui Province, P.R China.  
**Phone / Fax** : +86 0550-3169988

**Product Name** : Plastic Sheet&Plate&Film Extrusion Line  
**Product Type** :  
**Product Model(s)** : JWZN25, JWZN30, JWZN35, JWZN45, JWZN50,JWZN55,JWZN60, JWZN65, JWZN70, JWZN75, JWZN80, JWZN90, JWZN100, JWZN105, JWZN120, JWZN130, JWZN150, JWZN160, JWZN170, JWZN180, JWZN200, JWZN220, JWZN250, JWZN300, JWZN350, JWZN400, JWZN450, JWZN500, JWZS45, JWZS55, JWZS65, JWZS72, JWZS80, JWZS92, JWZS95, JWZS98, JWZS110, JWZS115, JWZTP75, JWZTP90, JWZTP93, JWZTP107, JWZTP120, JWZTP130, JWZTP135, JWZP25, JWZP35, JWZP52, JWZP75, JWZP85, JWZP95, JWZP110, JWZP120, JWZP135

**Related Directives** : 2006/42/EC - Machinery Directive;  
**Harmonized Standards** : EN ISO 12100:2010 Safety Of Machinery — General Principles For Design — Risk Assessment And Risk Reduction.  
EN 1114-1:2011/ Rubber and Plastic Machines-Extruders and extrusion lines-Part 1 Safety requirements for extruders  
EN 60204-1: 2018 Safety Of Machinery-Electrical Equipment Of Machines-Part 1: General Requirements.

*The described product/machines meet the essential requirements of the above mentioned standards and in our delivered version; comply with the appropriate basic essential health and safety requirements of the based on Machinery Directive 2006/42/EC. In case of alteration of the machine, not agreed upon by Chuzhou Jwell Sheet & Plate & Film Intelligent Machinery Co.,Ltd; this declaration will lose its validity.*

**Production date** : 2023.03.05  
**Date of CE marking** : 2023.03.28  
**File Number** : JWELL-230323

## SIGNED ON BEHALF OF THE COMPANY

**Name & Position of the Authorized Person** : Chunhua Liu / General Manager

**PLACE / DATE** : Chuzhou City, China. March 29, 2023

**Signature**  
**Stamp**



## A.2 Specifications table

## A.3 Safety Pictures

### 1. Outside look of the machine



### 2. Front view of the machine



### 3. Back view of the machine



### 4. Parts of the machine



### 5. Control panels picture of the machine



### 6. Outside view of the machine's electrical cabinet



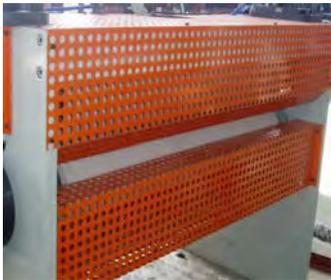
### 7. Inside view of the machine's electrical cabinet



## 8..electrical terminal safety guard



## 9.Safety guards of the machine



## 10.The warning marks



### 11. Emergency stop



### 12. Fixation of cables and conduits



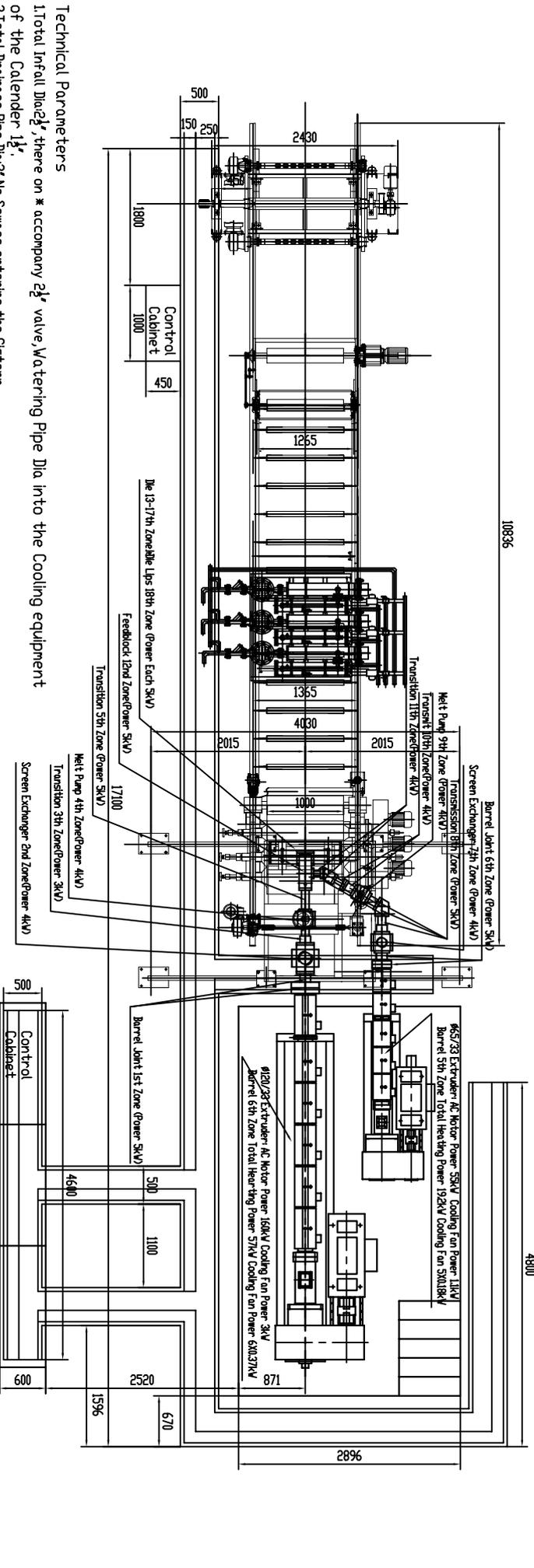
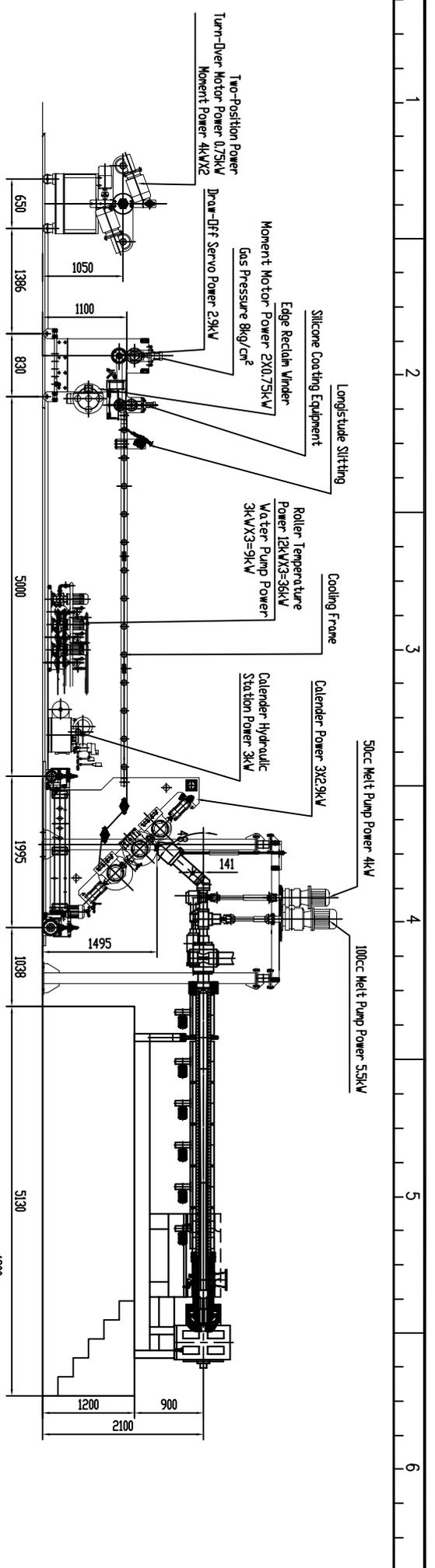
### 13. acoustic signal device



### 14. The ground terminal of the machine



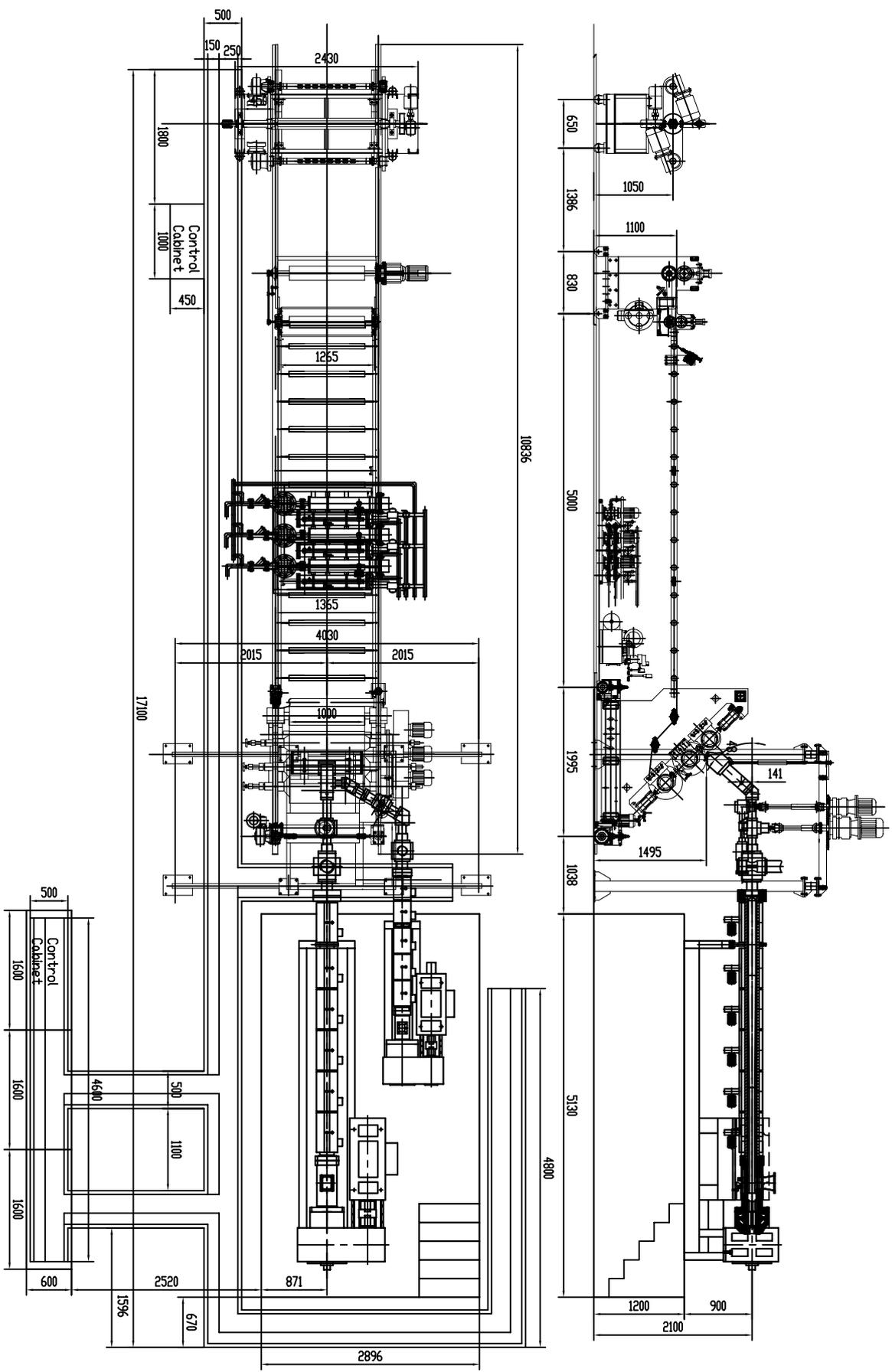
## A.4 Mechanical drawing



Technical Parameters

- Total Infall Dia $\phi_2$ , there on \* accompany  $\phi_2$  valve, Watering Pipe Dia into the Cooling equipment of the Calendar  $\phi_1$ .
- Total Drainage Pipe Dia $\phi_3$ , No Sewage entering the Cistern.
- Total Gas Pipe burying underground, Pipe Dia $\phi_4$ , accompany  $\phi_4$  Ball Valve on the floor.
- Cables and the gas pipe buried underground channel while finished assembling with the cast cap.
- Total Cost of Water 1.5m<sup>3</sup>/h.
- Gas Pressure 0.6-0.8MPa, Gas Consumption 1.5m<sup>3</sup>/h.
- Ground guide Center Width to be 1365mm, Fixed the guide with inflated Screw while assembling finished.
- Water Flux 31m<sup>3</sup>/h, Pressure 1-4kg/cm<sup>2</sup>, Temperature <math>35^{\circ}\text{C}</math>, accompany with the cooling Tower.
- Total Power > 630kVA (including the extruder and the precrys(tallization) AC 380V 50Hz, Control Power AC 220V 50Hz
- The Power with earthing Protection Line. Beside the control Cabinet with preburied Resistor <math>4</math>.

Rev.	Approved Date	Remarks	DRAWN	CHECKED	TITLE	
			DESIGNED	APPROVED	SCALE	DRAWING NO.
					NO	ISSUED DATE
					Shanghai Jwell Machinery Co., Ltd	
					General drawings	



Rev.	Approved Date	Remarks

DRAWN  
DESIGNED

CHECKED  
APPROVED

Shanghai Jwell Machinery Co., Ltd

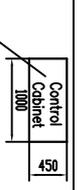
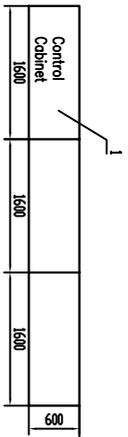
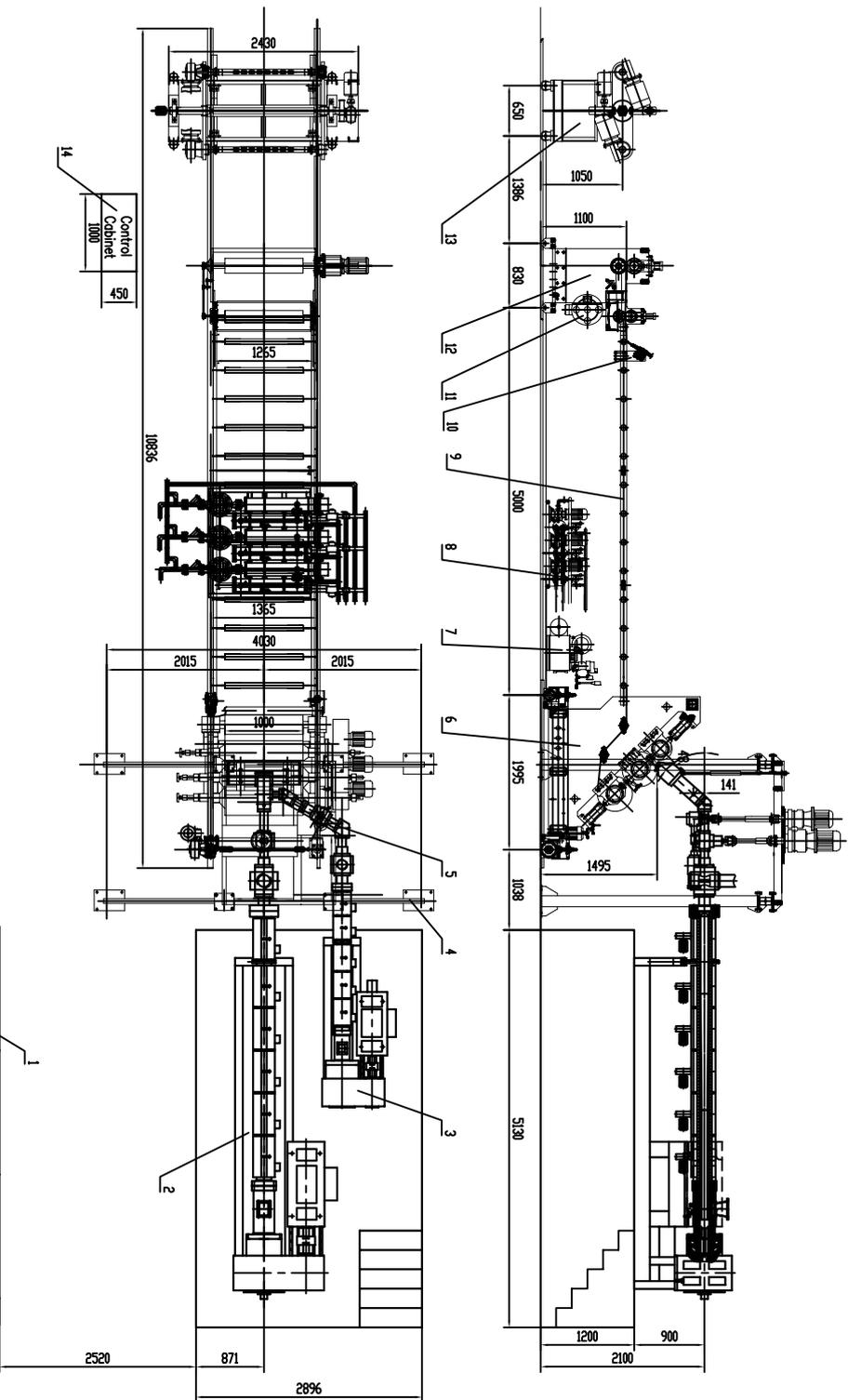
SCALE  
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TITLE  
General drawings

NO	ISSUED DATE

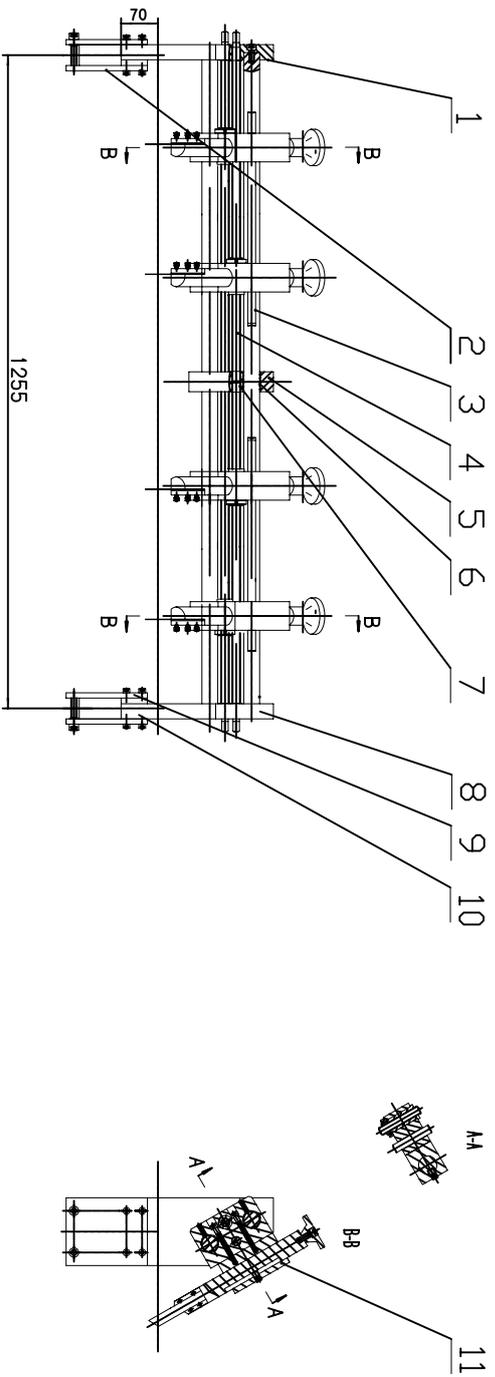






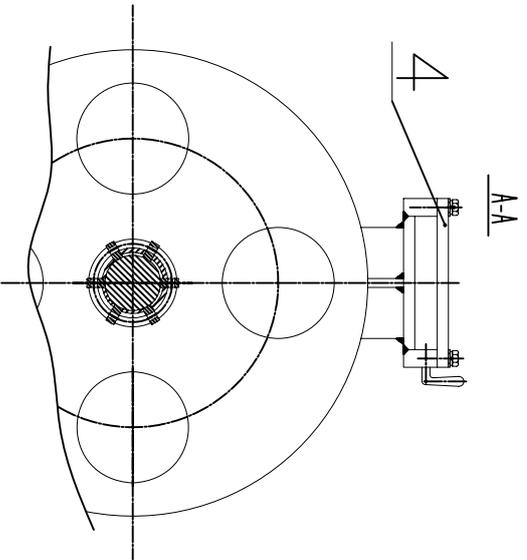
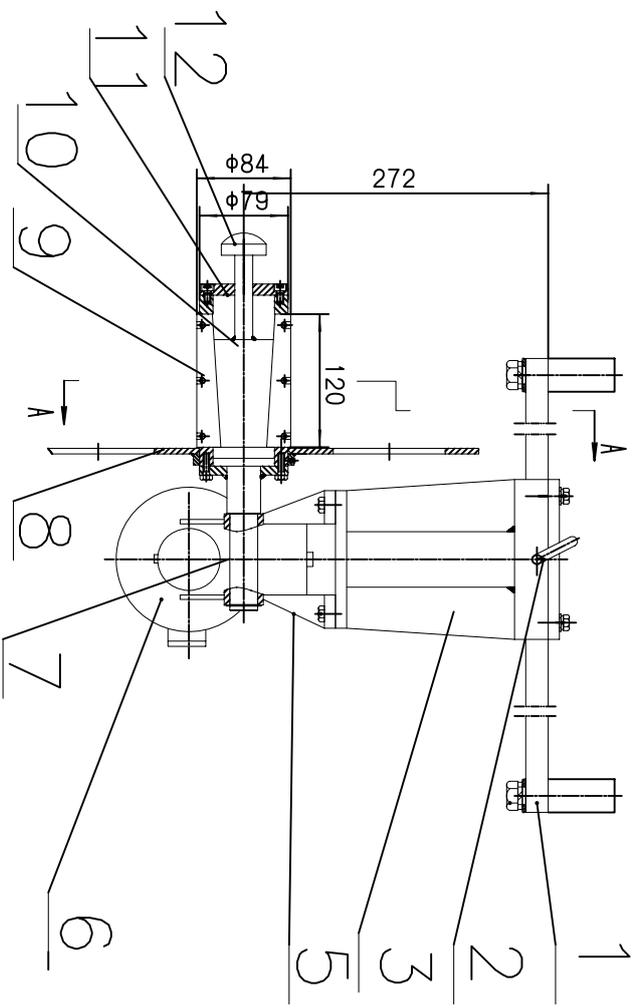
No.	Name	Remarks
1	Control Cabinet	
2	#120 Extruder	
3	#65 Extruder	
4	Control Cabinet	
5	Control Cabinet	
6	Coldender	
7	Power Hydraulic Station	
8	Roller Temperature	
9	Cooling Frame	
10	Blowdown Cooling Equipment	
11	Edge Reclaim Winder	
12	Control Cabinet	
13	Control Cabinet	
14	Control Cabinet	

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			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						General assembly drawings



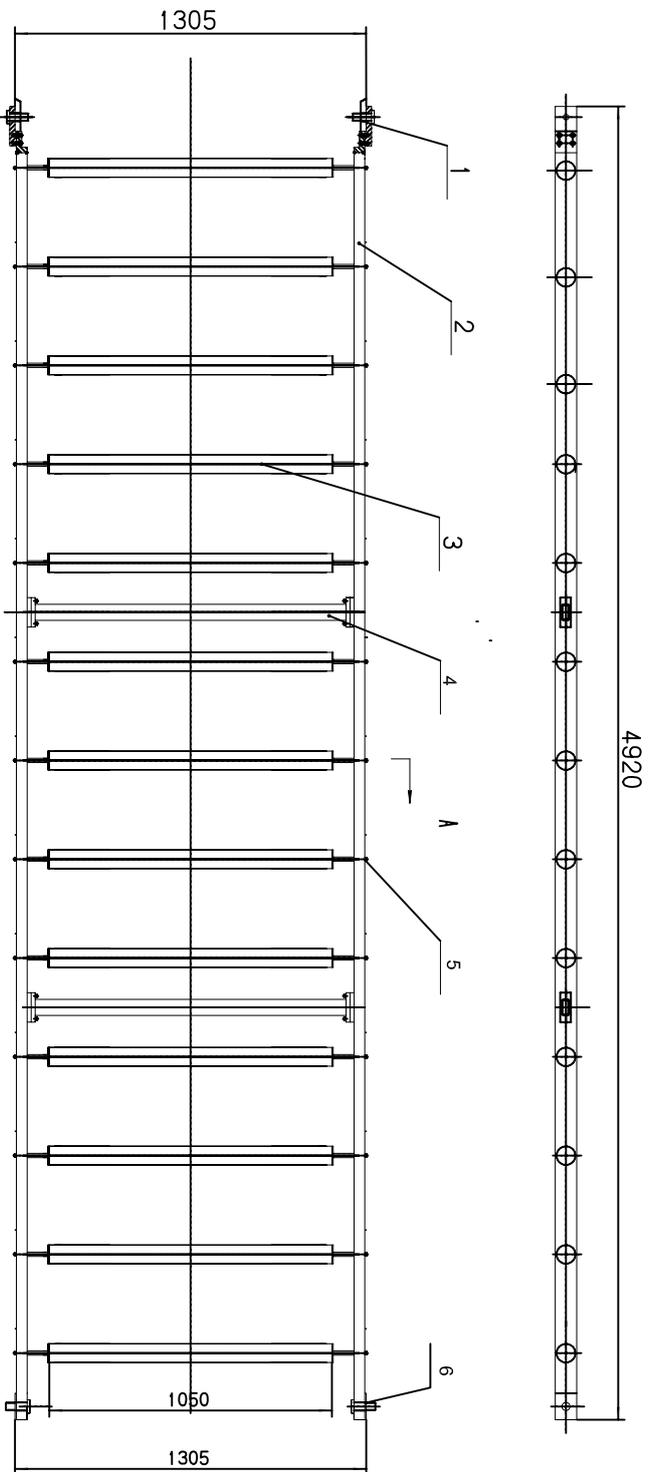
No.	Name	Remarks
1	left supporting plate	
2	inner press plate	
3	guide column	
4	screw	
5	middle support rocker	
6	self lubrication bearing	
7	self lubrication bearing	
8	right support plate	
9	pad	
10	outer press plate	
11	knife frame units	

Rev.	Approved Date	Remarks	DRAWN	CHECKED	Shanghai Jwell Machinery Co.,Ltd		
			DESIGNED	APPROVED	SCALE	TITLE	side trim unit
					NO	DRAWING NO.	
						ISSUED DATE	



No.	Name	Remarks
1	connection plate	
2	screw M10X20	
3	gearbox slide rocket	
4	cover plate	
5	gearbox	
6	moment motor	
7	drive axis	
8	block plate	
9	expansion block	
10	push plate	
11	cover plate	
12	handle	

Rev.	Approved Date	Remarks	DRAWN	CHECKED	Shanghai Jwell Machinery Co.,Ltd		
			DESIGNED	APPROVED	SCALE	TITLE	waste side winder
					NO	DRAWING NO.	
						ISSUED DATE	



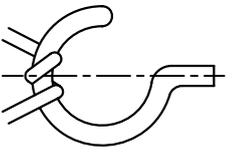
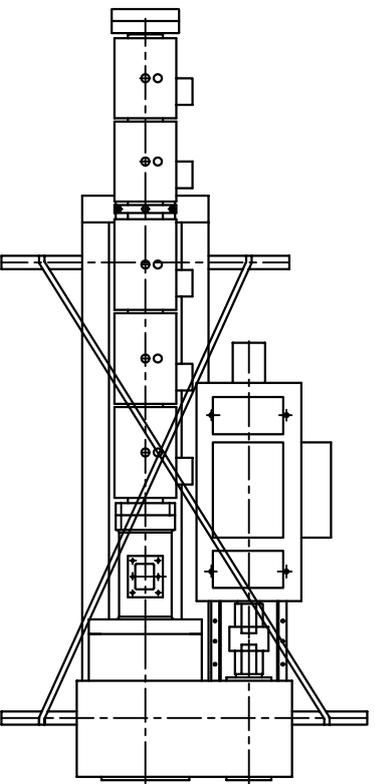
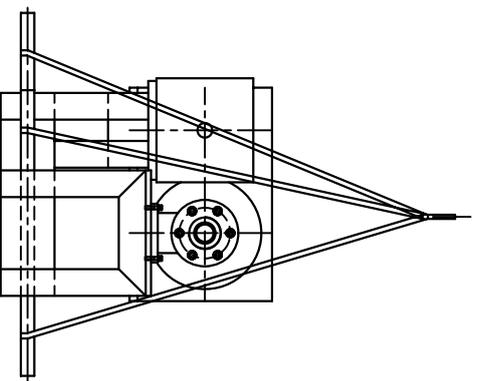
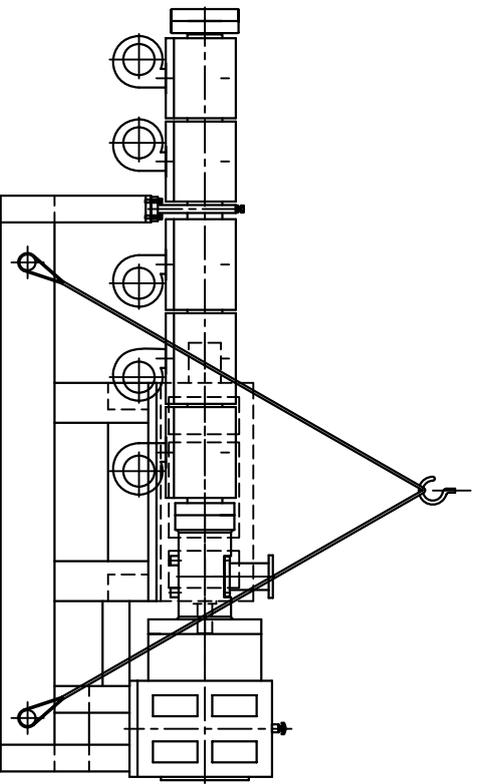
No.	Name	Remarks
1	connection plate	
2	cooling support frame	
3	cooling roller	
4	connection tube	
5	sleeve	
6	bolt	

Rev.	Approved Date	Remarks

DRAWN		CHECKED		<b>Shanghai Jwell Machinery Co., Ltd</b> SCALE NO TITLE DRAWING NO. ISSUED DATE cooling convey frame	
DESIGNED		APPROVED			

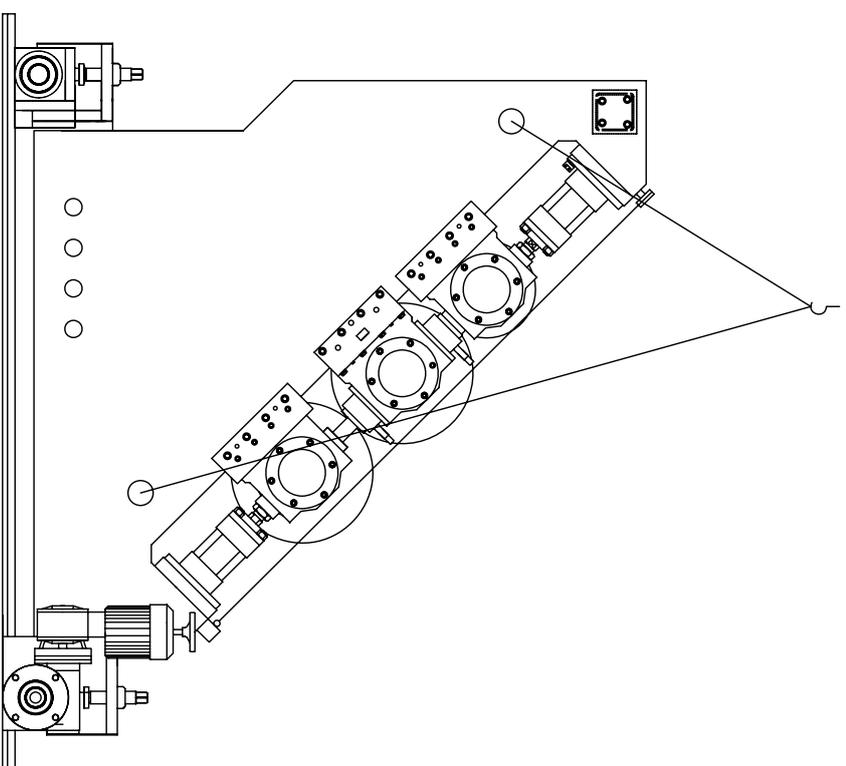




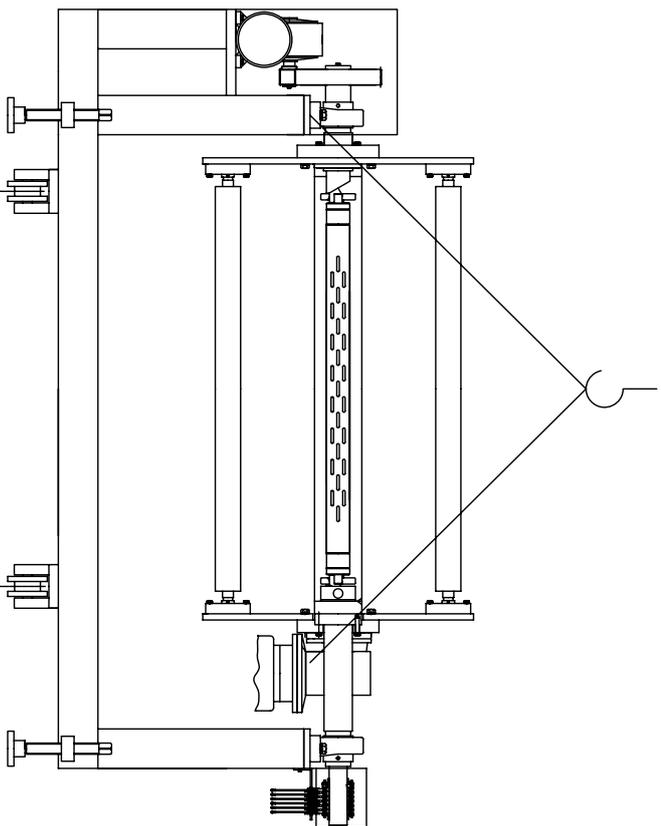
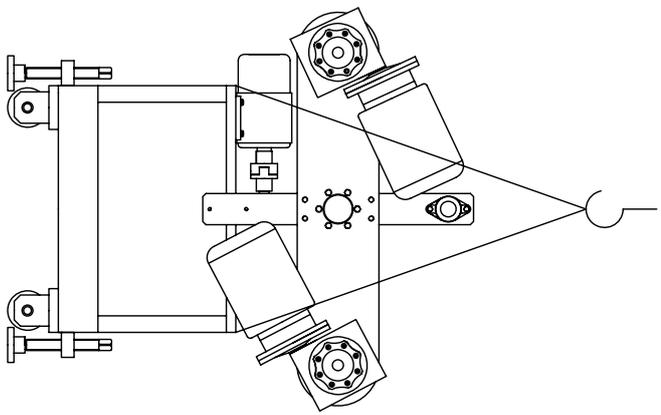


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			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						JMD lift and sling drawing



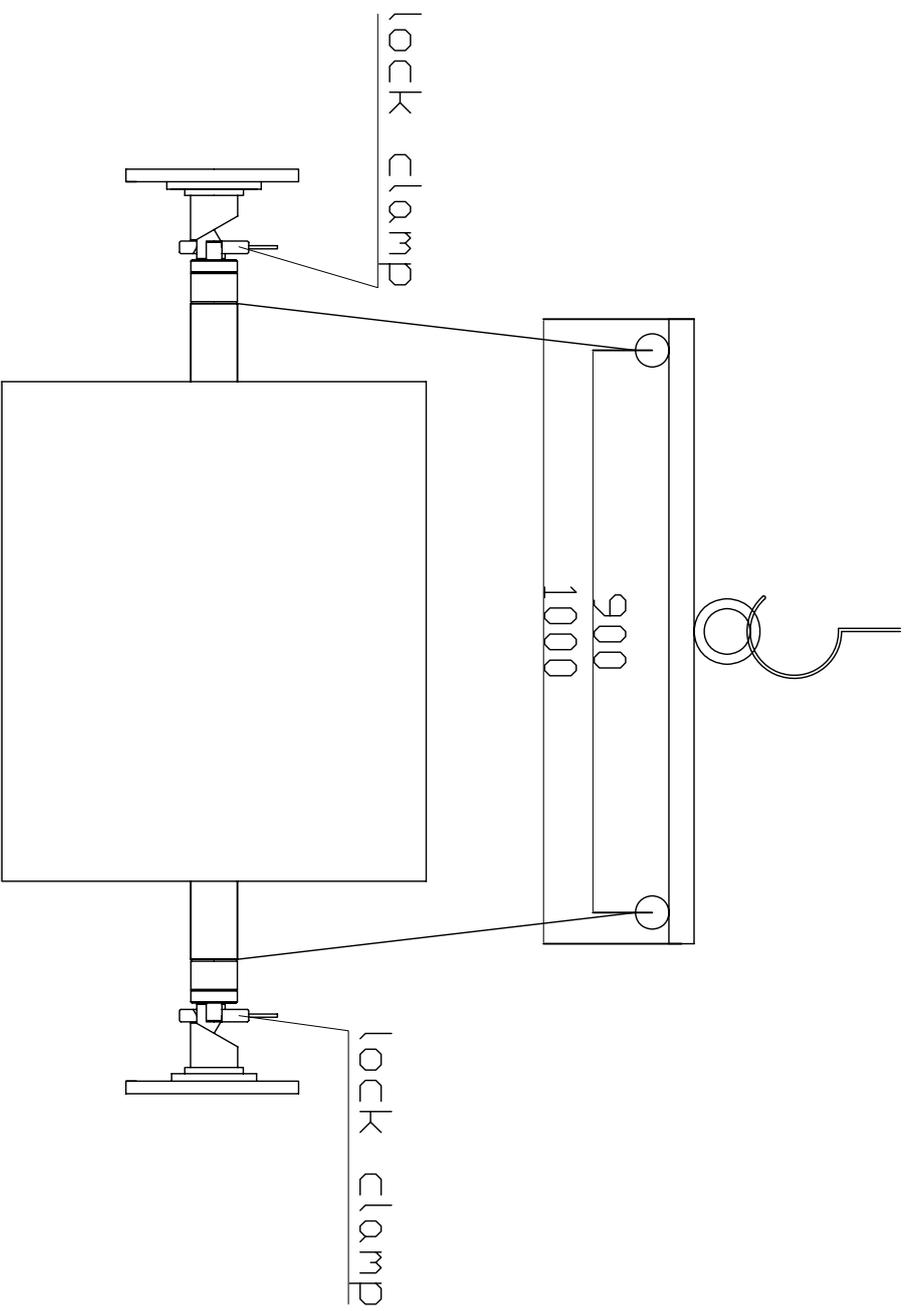


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						NO	ISSUED DATE	



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			DESIGNED	APPROVED					
					SCALE	TITLE	lift and sling for winder		
					NO	DRAWING NO.			
						ISSUED DATE			

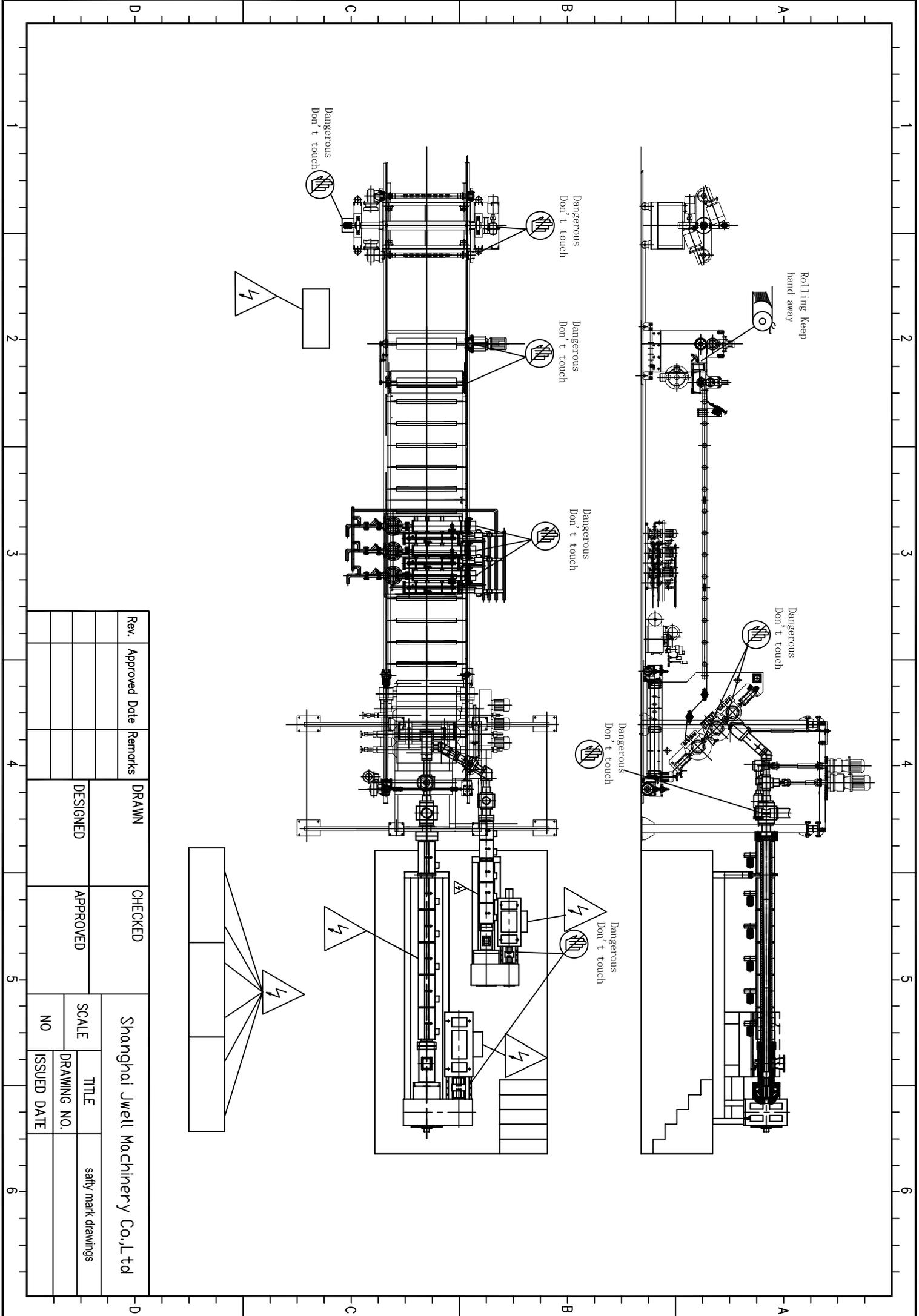




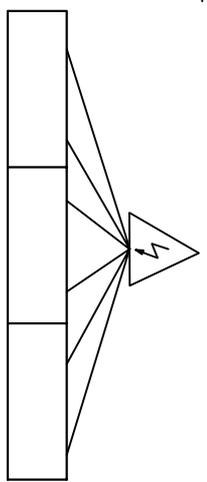
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DRAWN	CHECKED
DESIGNED	APPROVED

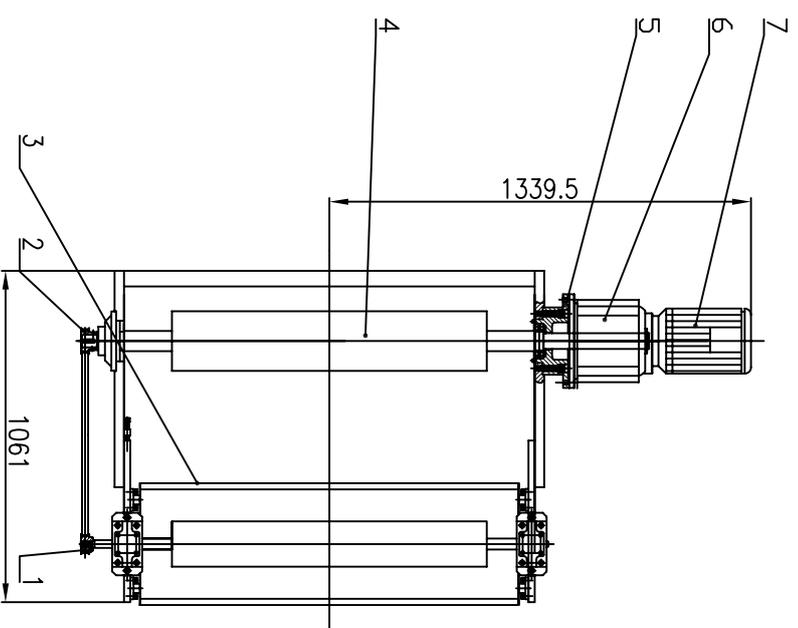
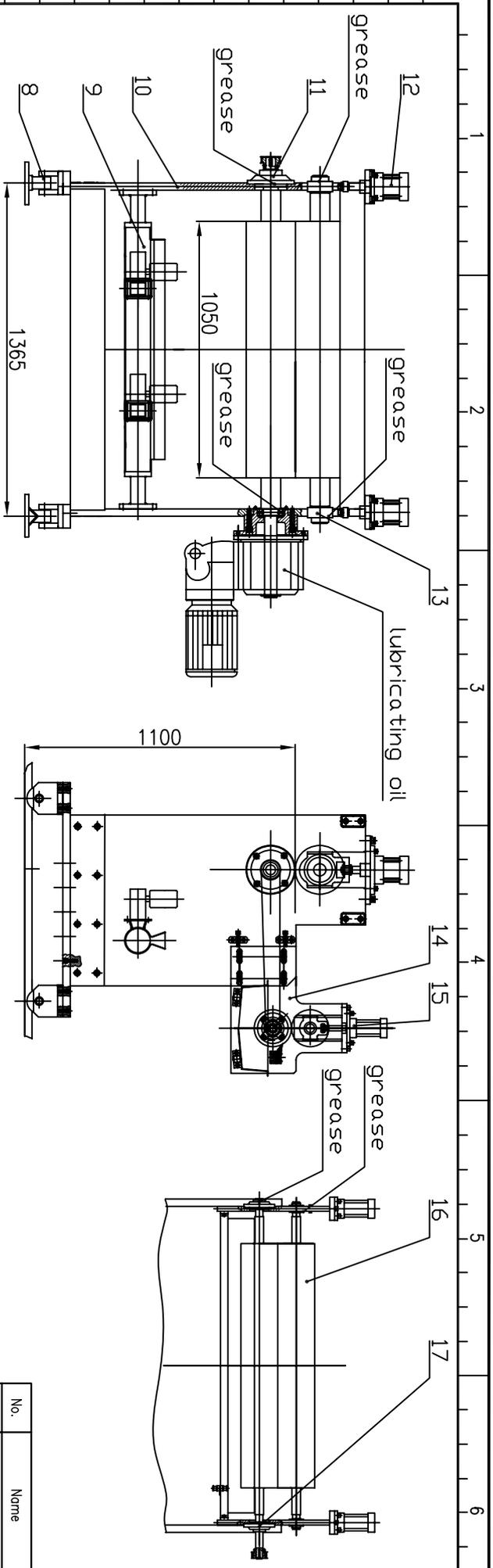
Shanghai Jwell Machinery Co.,Ltd			
SCALE NO	TITLE	lift and sling drawing for winder axis	
	DRAWING NO.		
ISSUED DATE			



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			DESIGNED		APPROVED		SCALE	TITLE
							NO	DRAWING NO.
								ISSUED DATE
								safly mark drawings





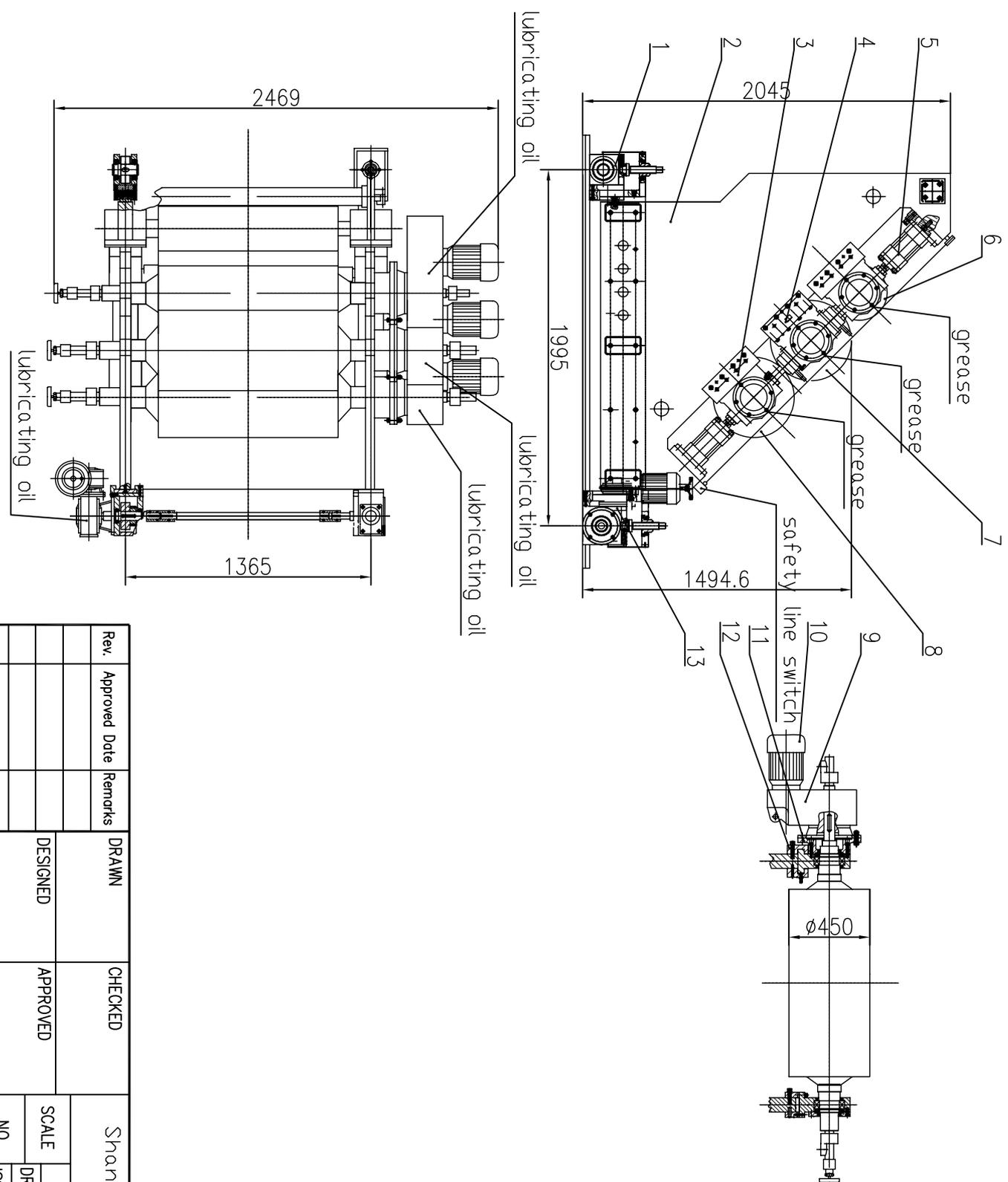


No.	Name	Remarks
1	small belt wheel	
2	big belt wheel	
3	oil quill	
4	haul roller	
5	frange for gear box	
6	gear box	
7	drive motor	
8	foot wheel	
9	blower	
10	wall plate for haul off unit	
11	fixed bearing rocket	
12	impact cylinder	
13	bearing rocket	
14	oil paint unit wall plate	
15	impact cylinder for painting	
16	painting roller	
17	bearing for painting roller	

Rev.		Approved Date		Remarks		DRAWN		CHECKED		Shanghai Jewell Machinery Co., Ltd	
DESIGNED		APPROVED									
SCALE		TITLE		NO		DRAWING NO.		ISSUED DATE			
		Lubrication diagram of haul unit									

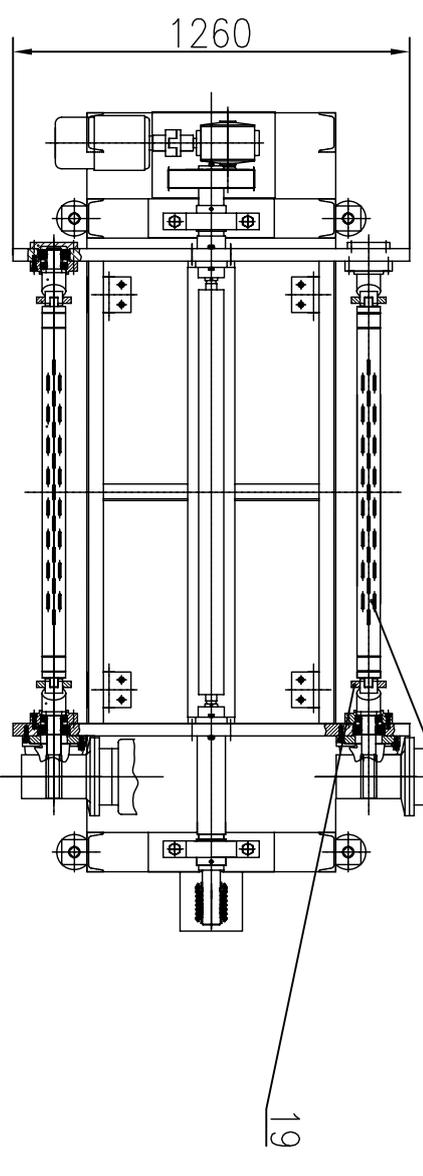
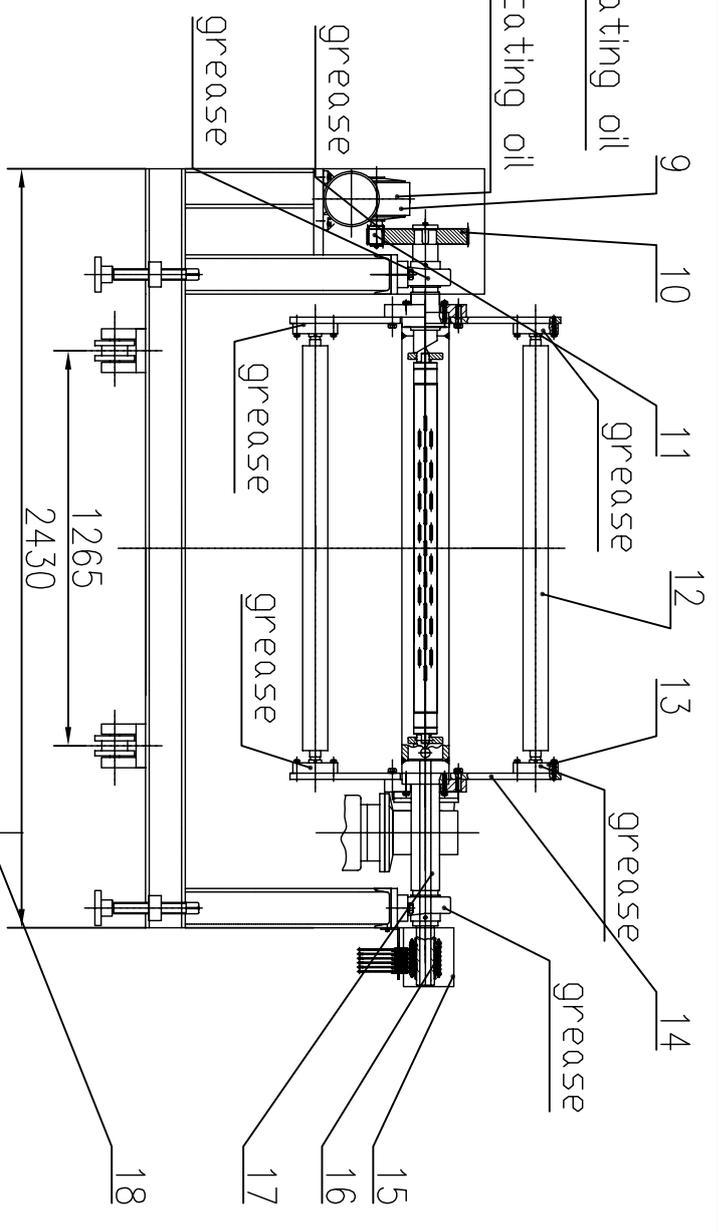
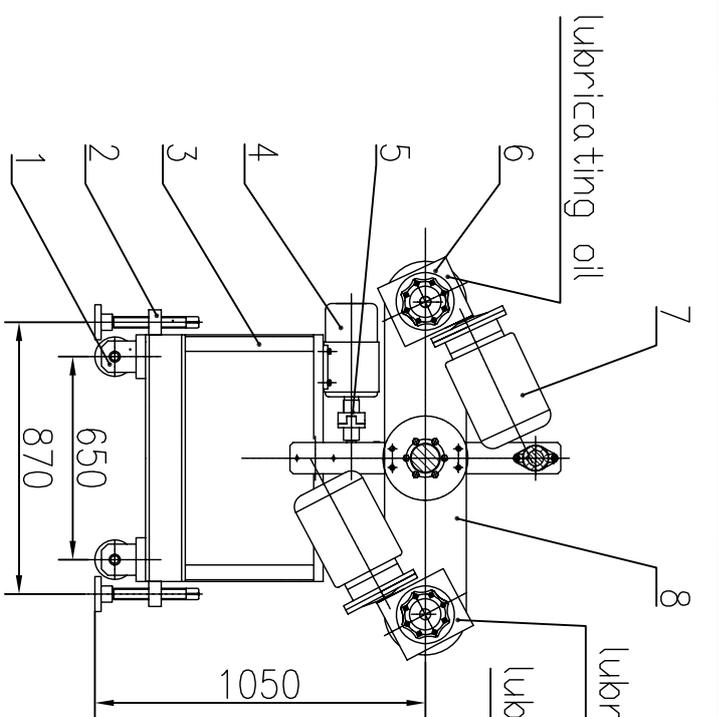
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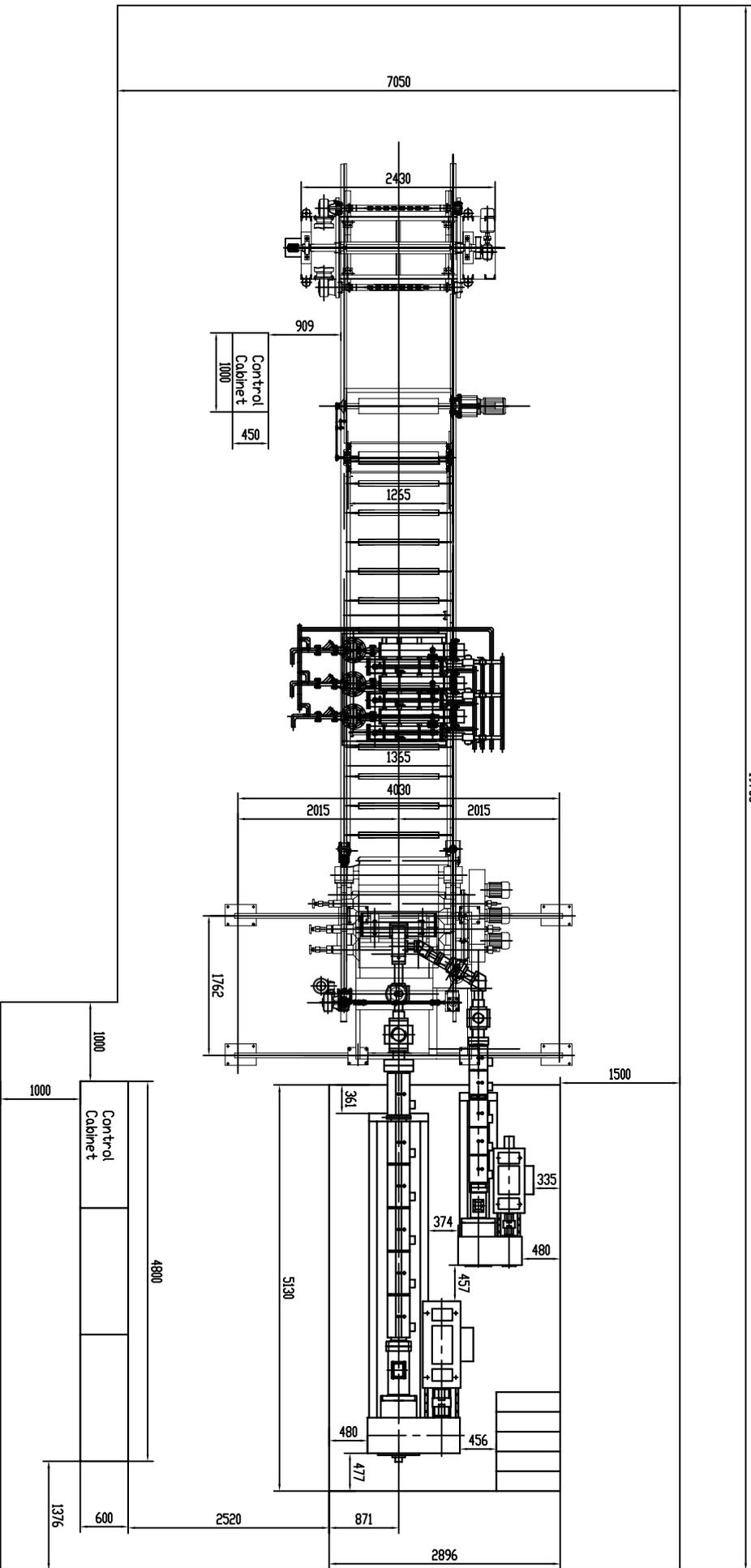
No.	Name	Remarks
1	back wheel group	
2	wall plate	
3	movable bearing rocket	
4	fixed bearing rocket	
5	impact oil cylinder	
6	up roller	
7	middle roller	
8	down roller	
9	gear box	
10	drive motor	
11	fix frame for gear box	
12	fix block for movable bearing	
13	drive system for front wheel	

Rev.		Approved Date		Remarks		DRAWN		CHECKED		Shanghai Jwell Machinery Co., Ltd	
DESIGNED		APPROVED									
SCALE		TITLE		DRAWING NO.		ISSUED DATE					
NO											
		Lubrication diagram of calendar									



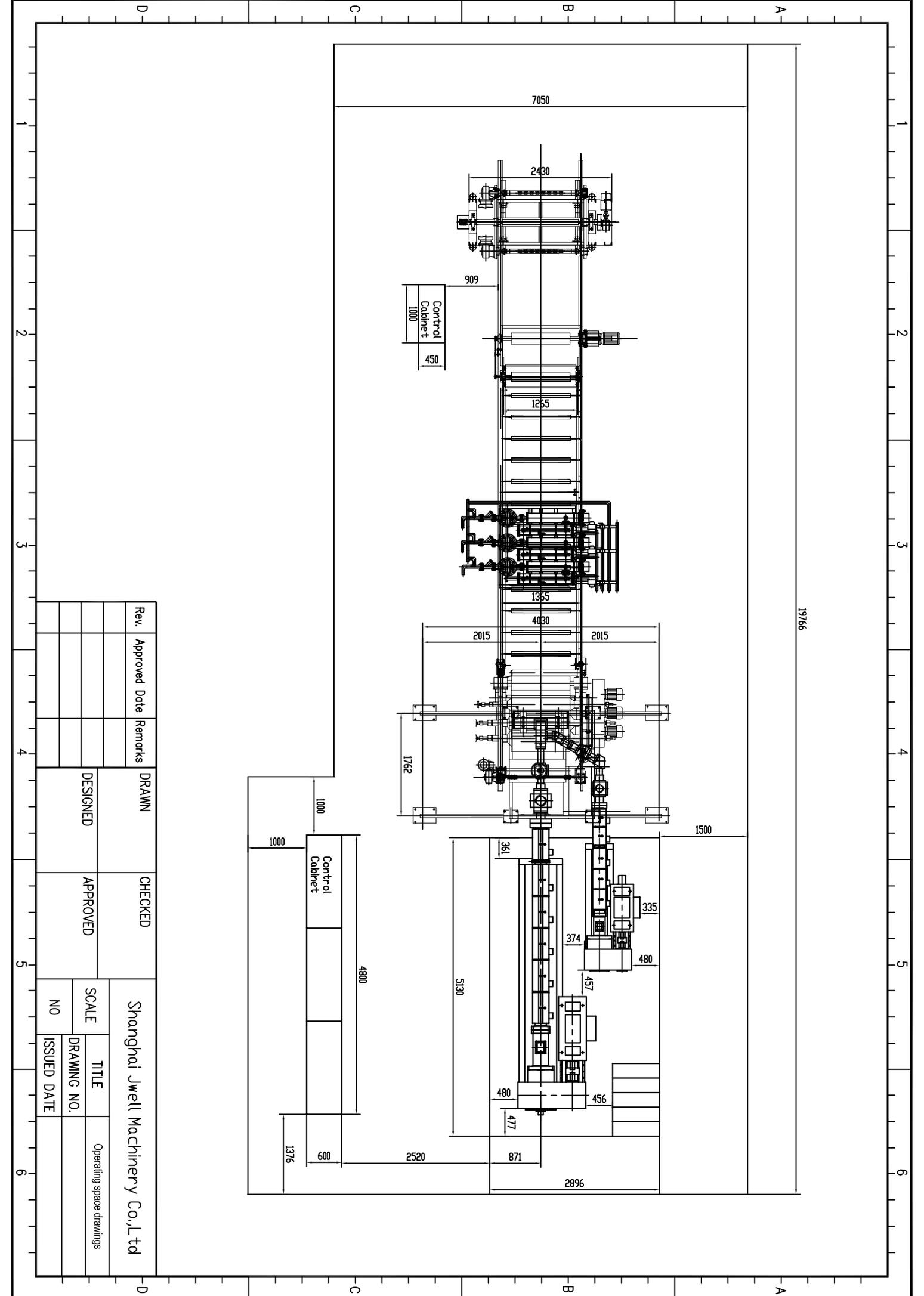
No.	Name	Remarks
1	脚轮	
2	地脚	
3	机架	
4	翻转电机	
5	联轴器	
6	收卷减速箱	
7	收卷电机	
8	翻转臂	
9	翻转减速箱	
10	翻转大齿轮	
11	翻转小齿轮	
12	过线轴	
13	过线轴承座	
14	过线臂	
15	集电环架	
16	集电环	
17	翻转轴	
18	收卷轴	
19	收卷铜夹头	

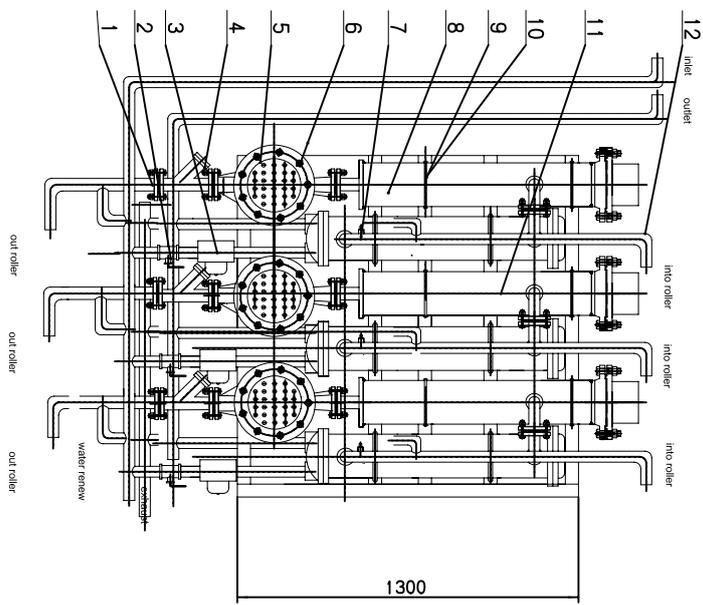
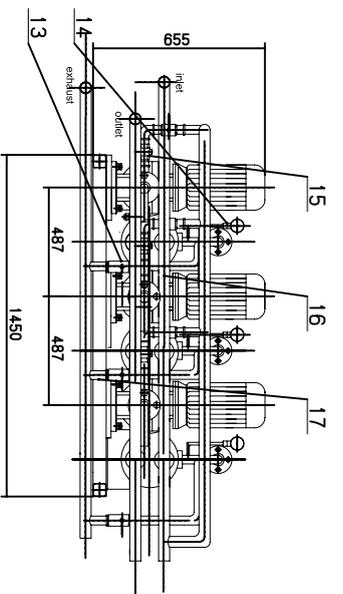
Rev.	Approved Date	Remarks	DRAWN	CHECKED	TITLE	
			DESIGNED	APPROVED	SCALE	DRAWING NO.
					NO	ISSUED DATE
					Shanghai Jwell Machinery Co.,Ltd	
					parts of winder	



19766

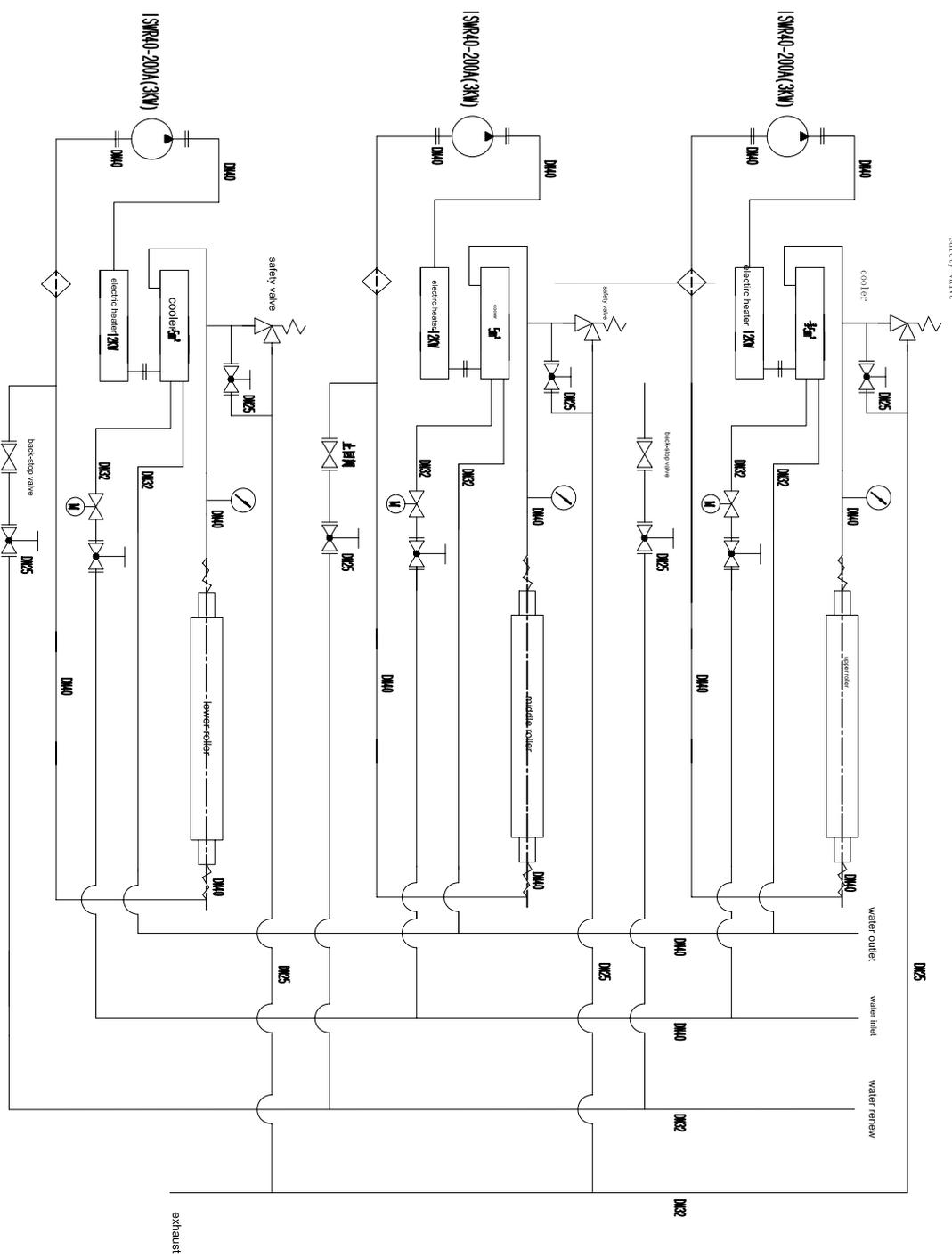
Rev.	Approved Date	Remarks	DRAWN		CHECKED		Shanghai Jwell Machinery Co., Ltd	
			DESIGNED	APPROVED	SCALE	TITLE	Operating space drawings	
					NO	DRAWING NO.		
						ISSUED DATE		





No.	Name	Remarks
1	flange DN40	
2	ball valve DN25	
3	electric-magnetic valve DN32	
4	filter DN10	
5	hot water pump	
6	frame	
7	thermocoupler	
8	heater	
9	fix ring for heater	
10	fix frame for heater	
11	cooler	
12	seamless tube	
13	safety valve	
14	protection pressure meter	
15	back-stop valve DN25	
16	seamless tube DN40	
17	seamless DN25	

Rev.	Approved Date	Remarks	DRAWN	CHECKED	Shanghai Jwell Machinery Co.,Ltd	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						water temperature controller



Rev.	Approved Date	Remarks	DRAWN	CHECKED	Shanghai Jwell Machinery Co., Ltd	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						water temperature controlling drawings

## A.5 Electrical system



Main Extruder Metering Pump

Metering Pump Signal

主机计量泵

主机计量泵  
电流  
(去PLC)

主机计量泵  
速度给定  
(来自PLC)

PLC Overcome Default Signal

故障信号去PLC

主机计量泵风机

换网器电源

备用电源

Main Extruder Fan

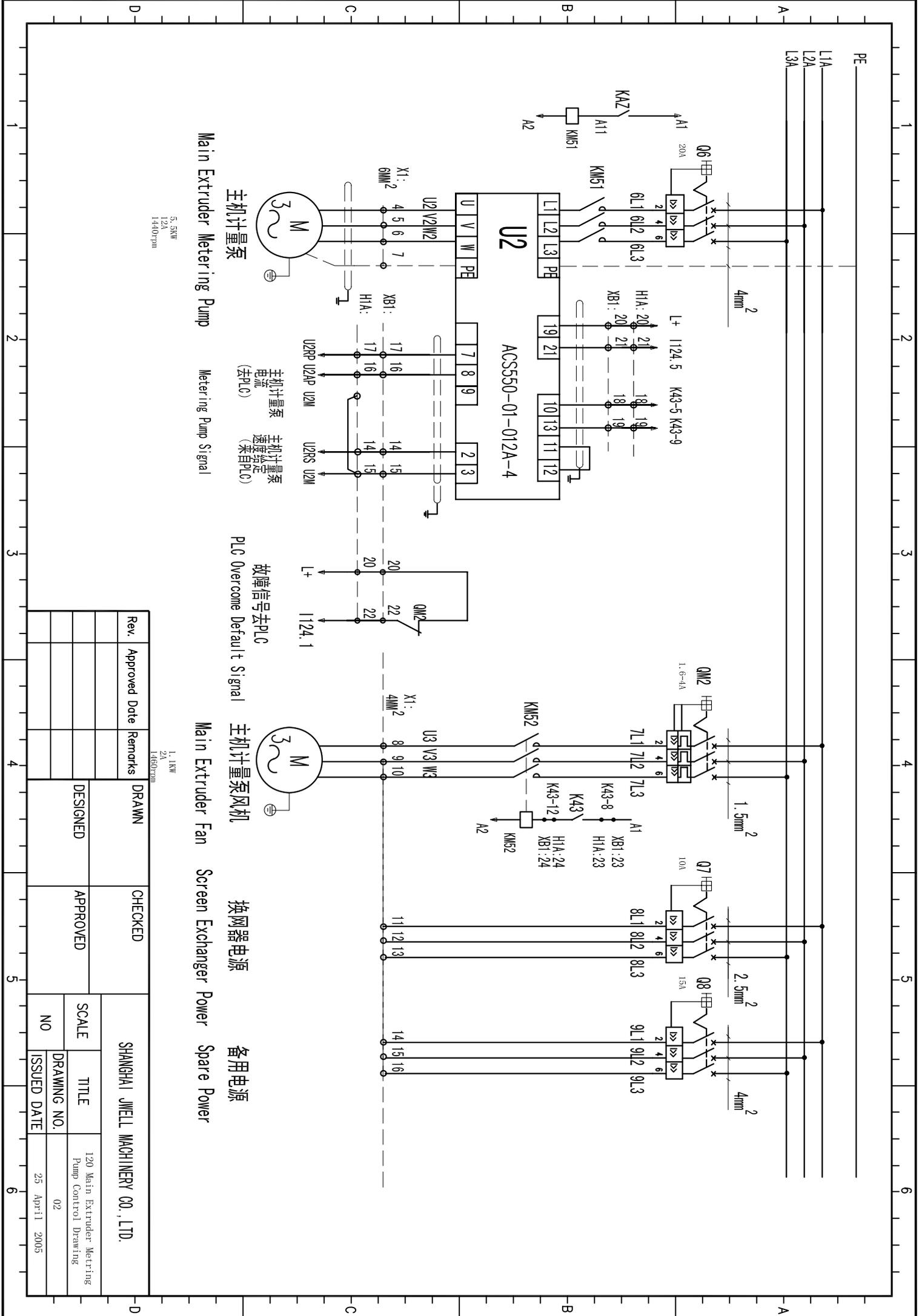
Screen Exchanger Power

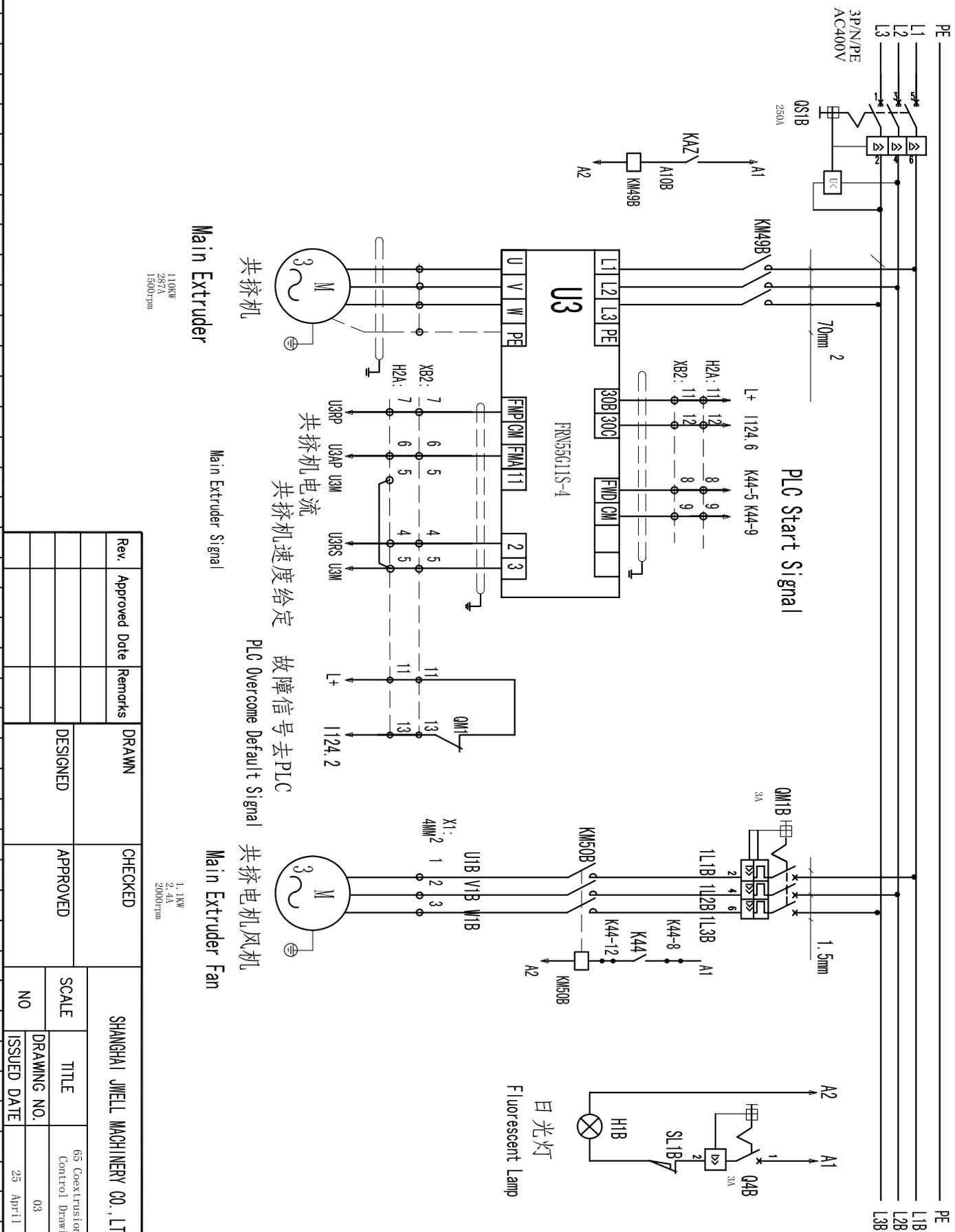
Spare Power

5.5KW  
12A  
1440rpm

1.1KW  
2A  
1460rpm

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						120 Main Extruder Metering Pump Control Drawing
						02
						25 April 2005





共挤机  
Main Extruder

1.10KW  
287A  
1500rpm

共挤机速度给定  
Main Extruder Signal

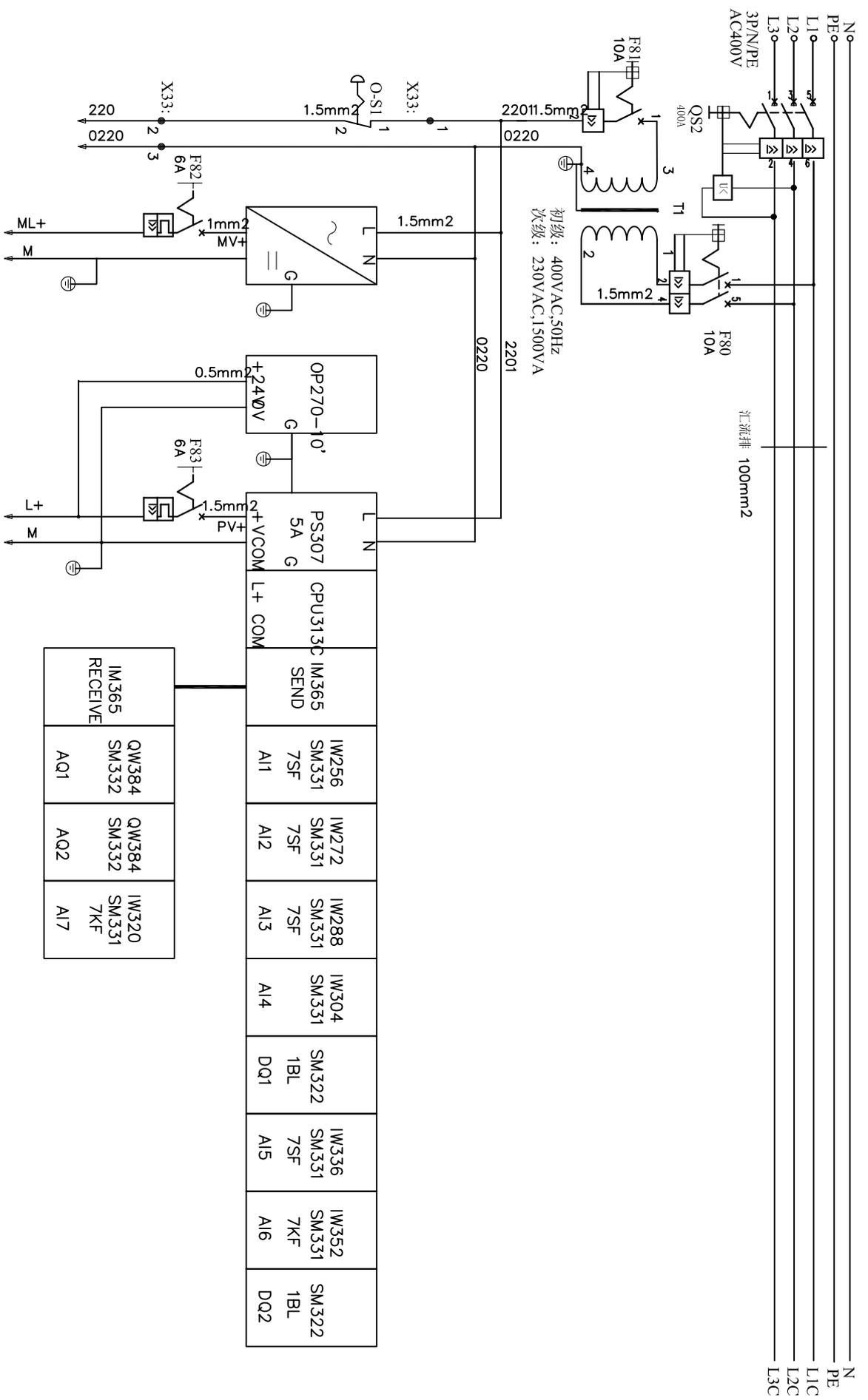
故障信号去 PLC  
PLC Overcome Default Signal

共挤电机风机  
Main Extruder Fan

1.1KW  
2.4A  
2000rpm

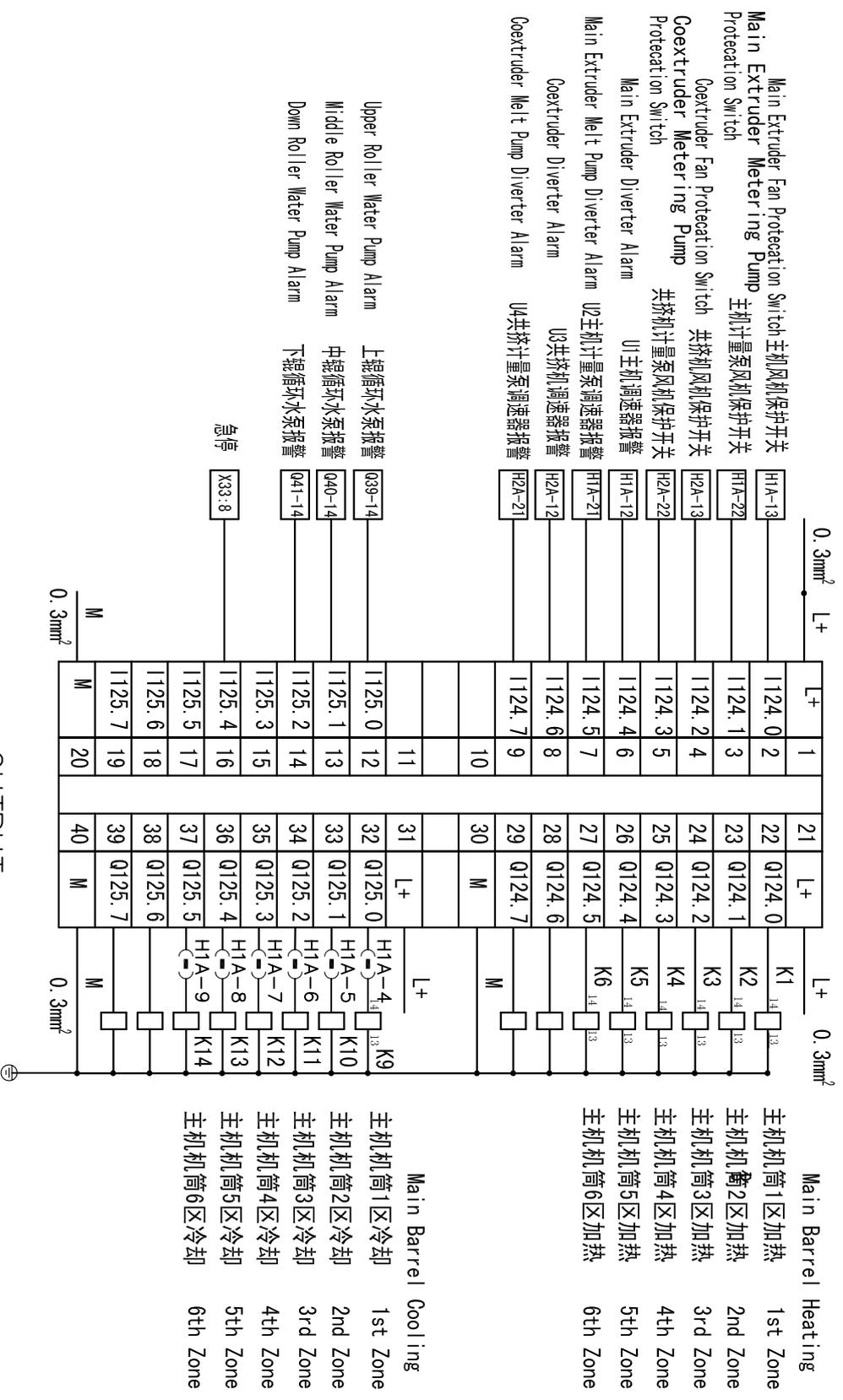
Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
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					DRAWING NO.	65 Coextrusion Force Control Drawing
					ISSUED DATE	25 April 2005





IM365 RECEIVE	QW384 SM332	QW384 SM332	IM320 SM331 7KF
IM365 SEND	AI1	AI2	AI3
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CPU313C(b)

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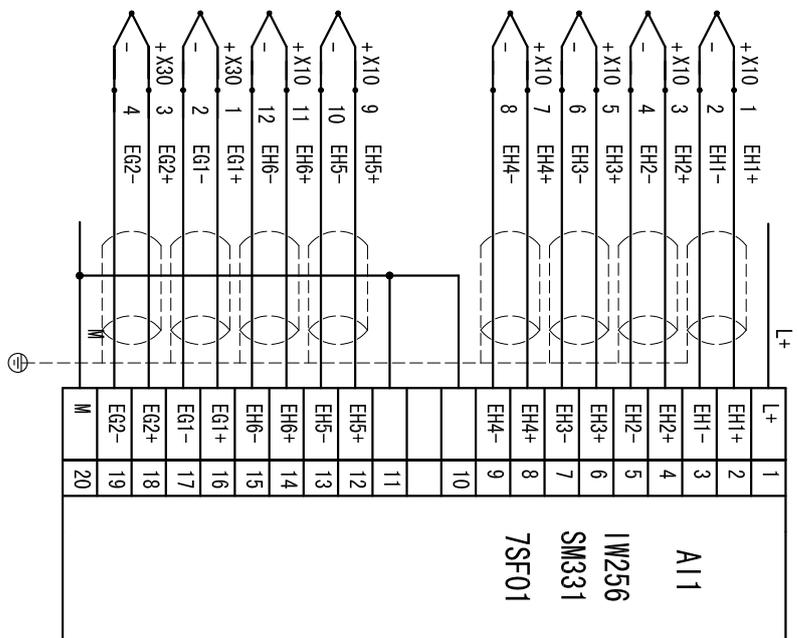
OUTPUT

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWELL MACHINERY CO., LTD.		
			DESIGNED	APPROVED	SCALE	TITLE	CPU 313C Module (b)
					NO	DRAWING NO.	07
						ISSUED DATE	25 Apr 11 2005

IM365  
SEND

Main Extruder Barrel Thermocouple

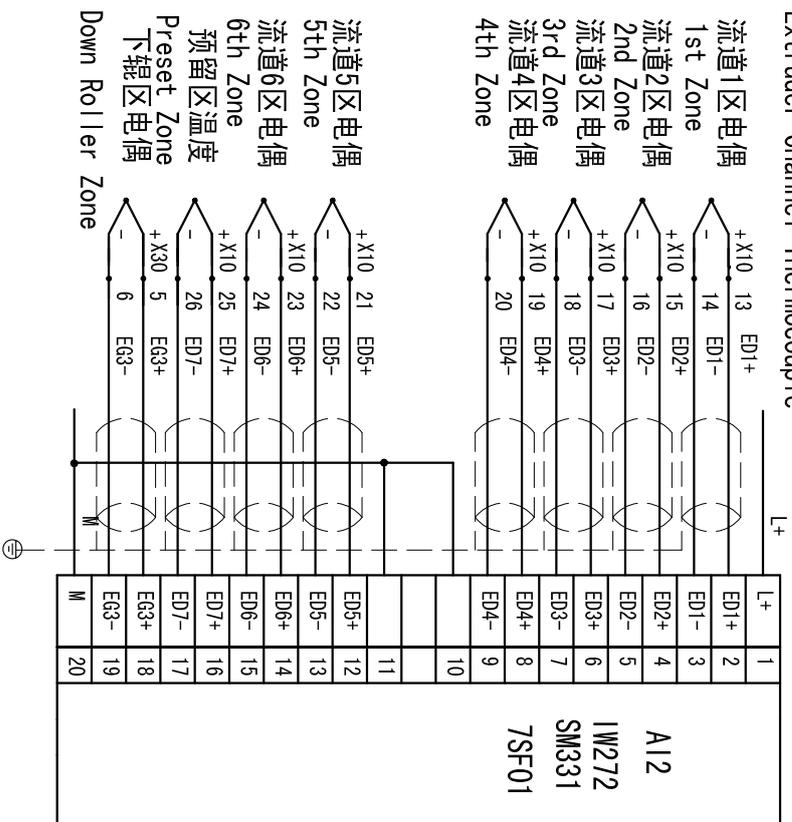
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- 2nd Zone 机筒2区电偶
- 3rd Zone 机筒3区电偶
- 4th Zone 机筒4区电偶
- 5th Zone 机筒5区电偶
- 6th Zone 机筒6区电偶
- Upper Roller 上辊区电偶
- Middle Roller 中辊区电偶



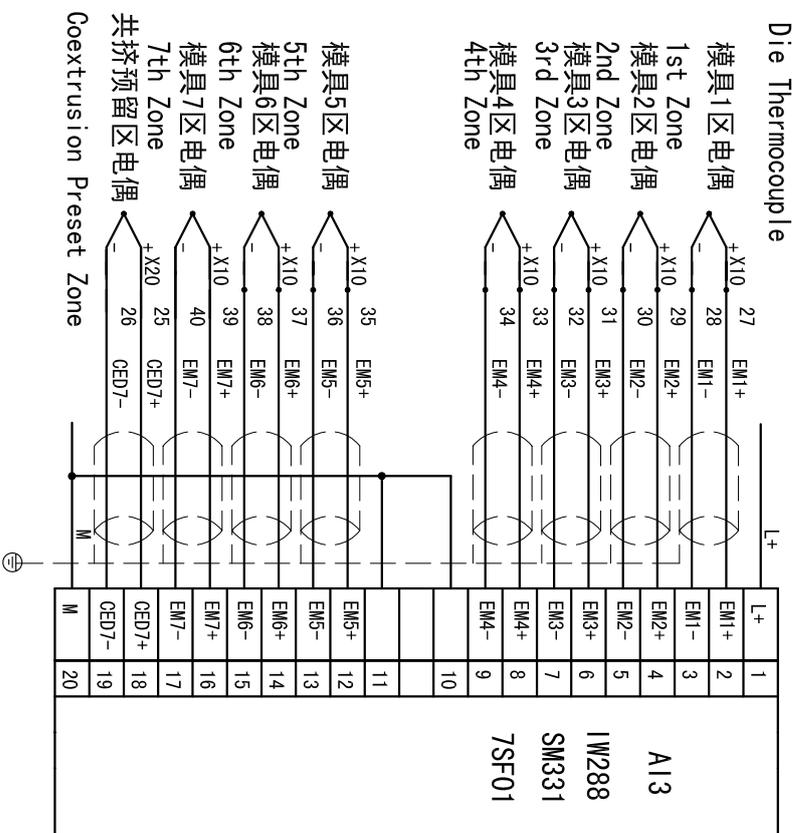
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EHI+	2	
EHI-	3	
EHI+	4	IW256
EHI-	5	
EHI+	6	
EHI+	7	SM331
EHI-	8	
EHI+	9	
EHI+	10	7SF01
EHI-	11	
EHI+	12	
EHI+	13	EH5+
EHI-	14	
EHI+	15	
EHI+	16	EH6+
EHI-	17	
EHI+	18	
EHI+	19	EH6-
EHI-	20	
EHI+	M	

Rev.	Approved Date	Remarks	DRAWN		CHECKED		SHANGHAI JWELL MACHINERY CO., LTD.		
			DESIGNED		APPROVED				
							SCALE	TITLE	SM331-1 Module
							NO	DRAWING NO.	
								ISSUED DATE	25 Apr'11 2005

Main Extruder Channel Thermocouple



Die Thermocouple

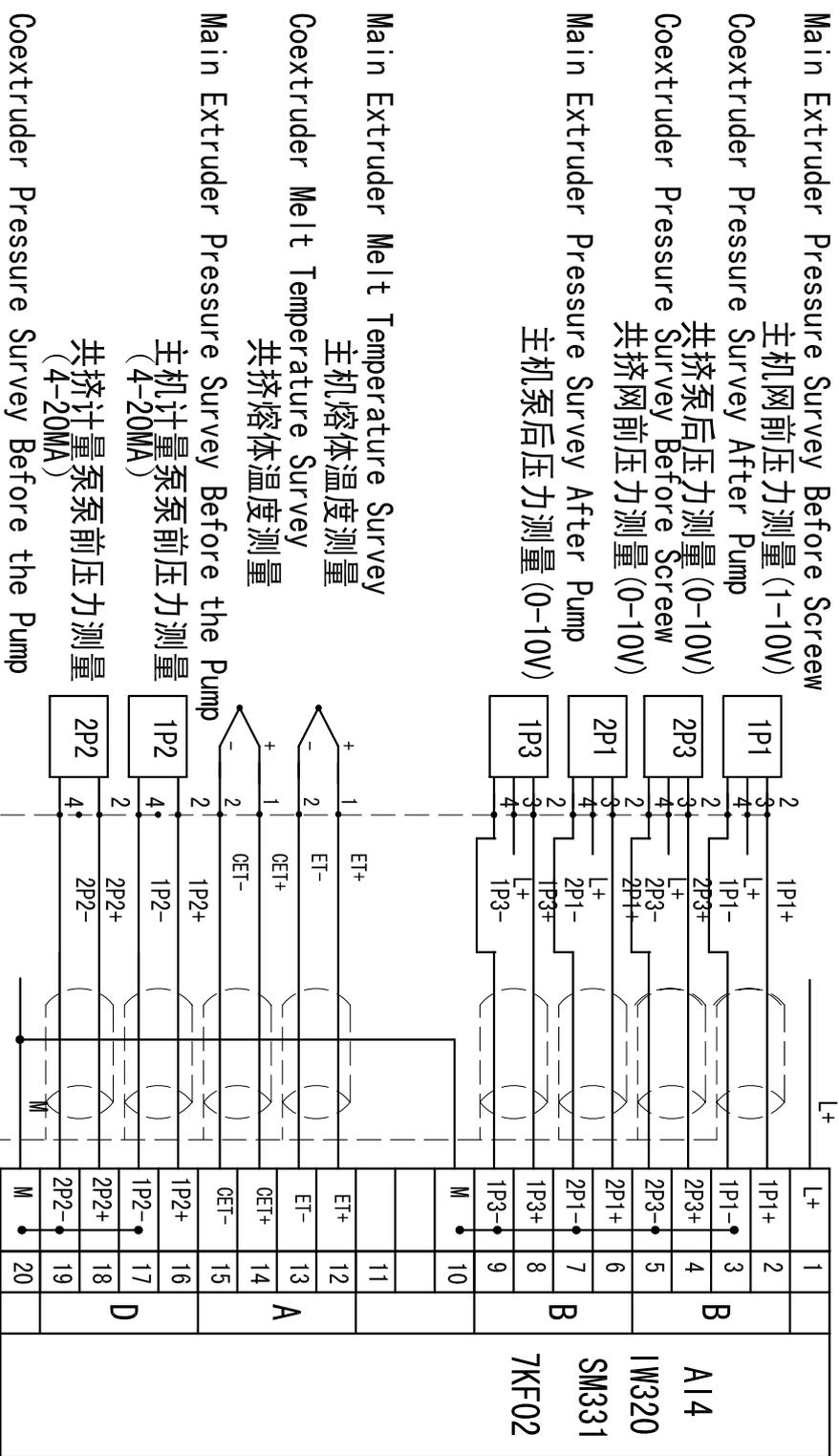


Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEILL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						25 Apr+1 2005

SM331-2, 3 Module

09

25 Apr+1 2005



航空插头针脚图  
Plug Sutral Drawing

Main Extruder Pressure Survey Before Scream  
主机网前压力测量 (1-10V)

Coextruder Pressure Survey After Pump  
共挤泵后压力测量 (0-10V)

Coextruder Pressure Survey Before Scream  
共挤网前压力测量 (0-10V)

Main Extruder Pressure Survey After Pump  
主机泵后压力测量 (0-10V)

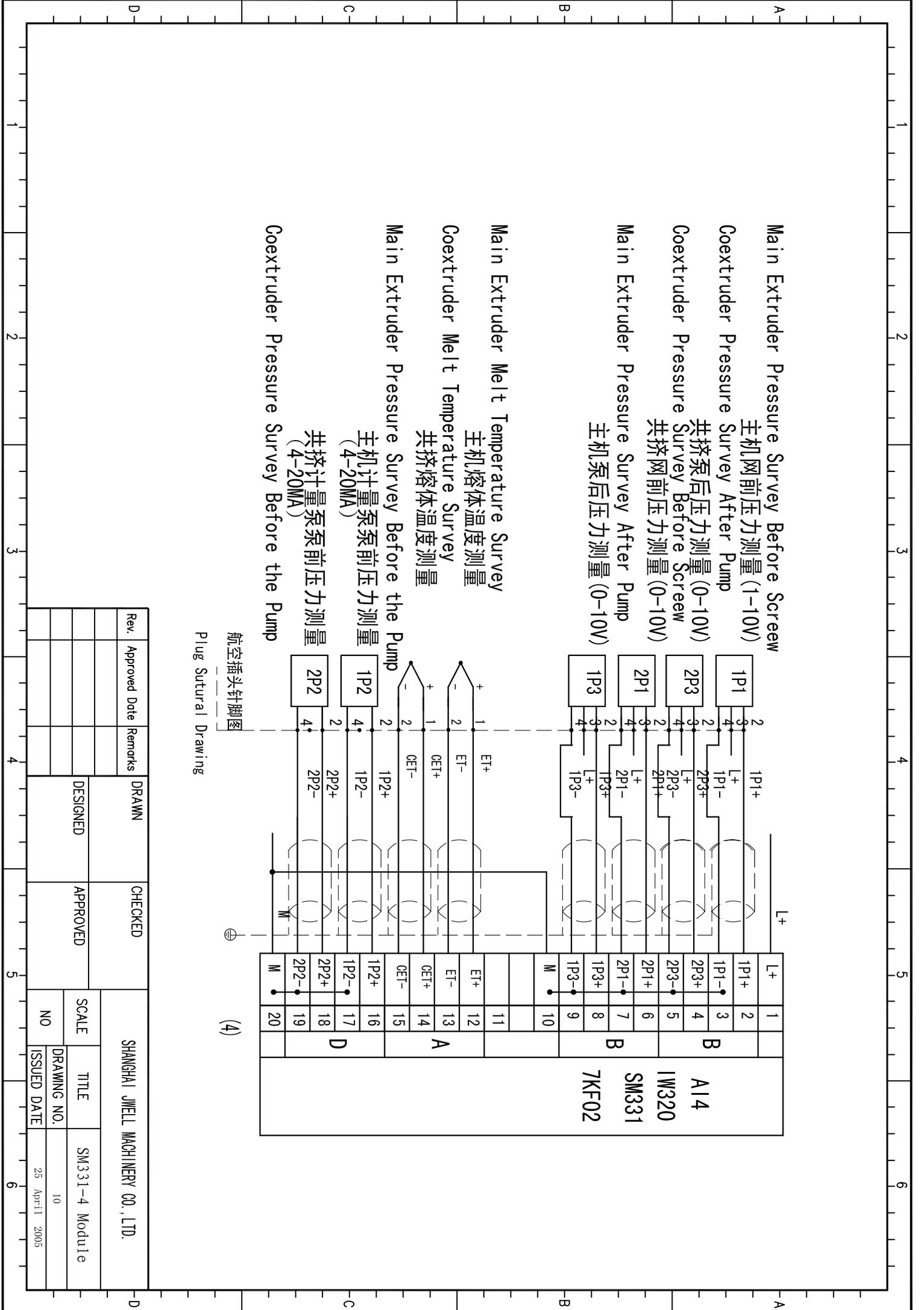
Main Extruder Melt Temperature Survey  
主机熔体温度测量

Coextruder Melt Temperature Survey  
共挤熔体温度测量

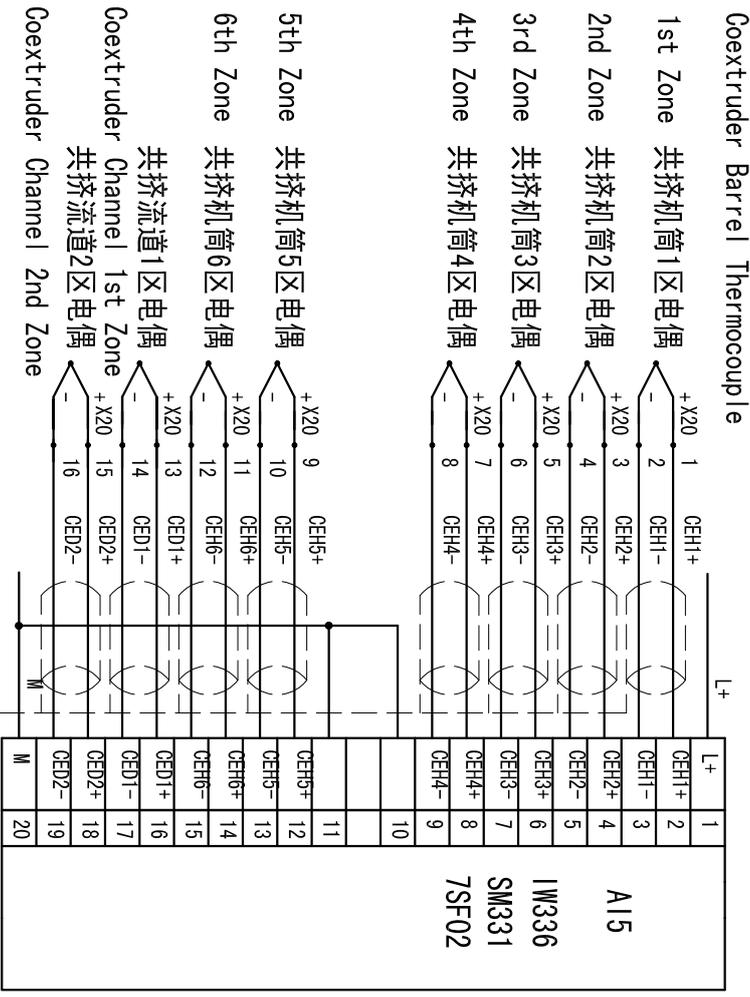
Main Extruder Pressure Survey Before the Pump  
主机计量泵泵前压力测量 (4-20MA)

Coextruder Pressure Survey Before the Pump  
共挤计量泵泵前压力测量 (4-20MA)

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEILL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					DRAWING NO.	SM331-4 Module
					ISSUED DATE	25 Apr'11 2005

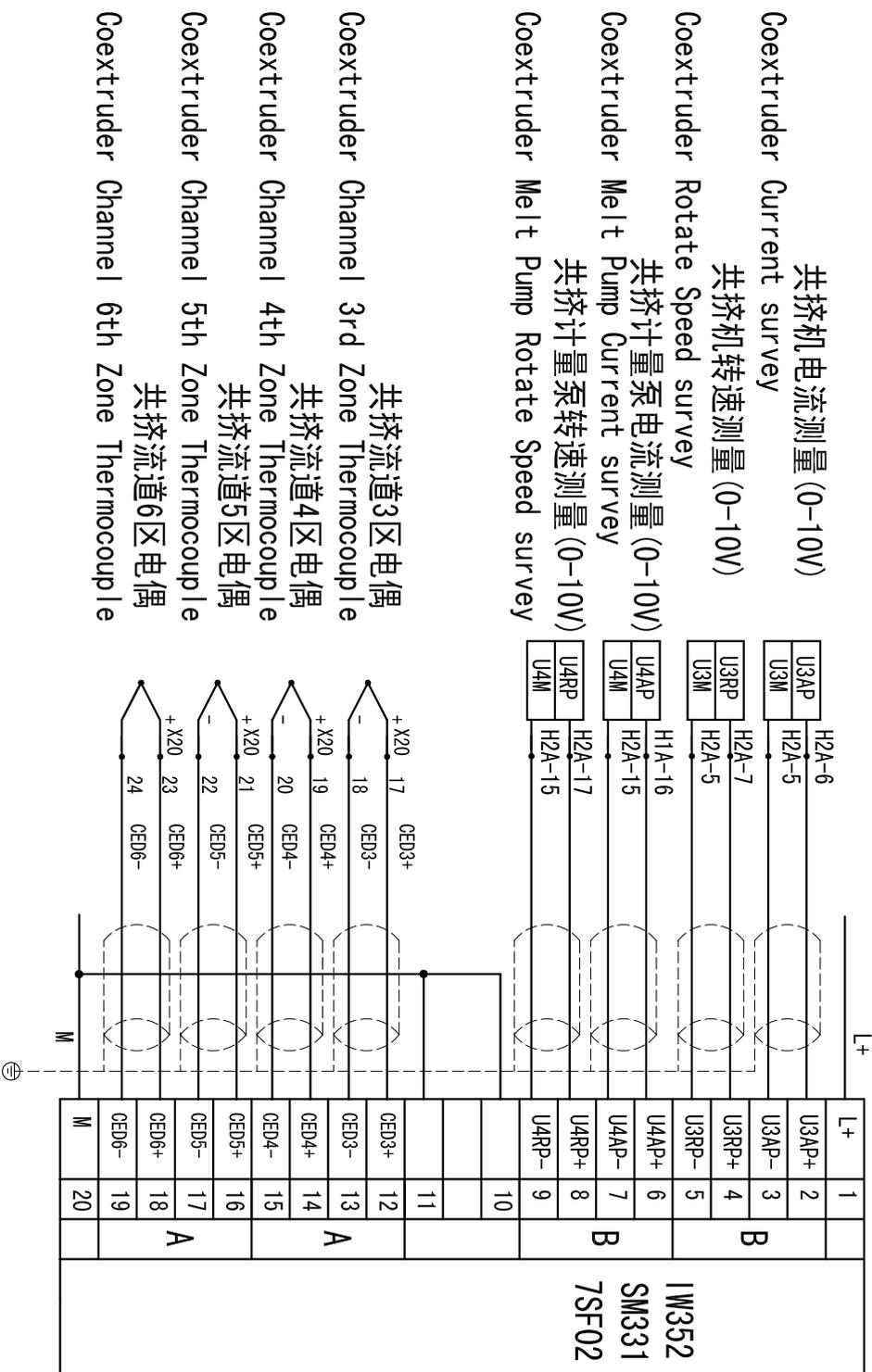




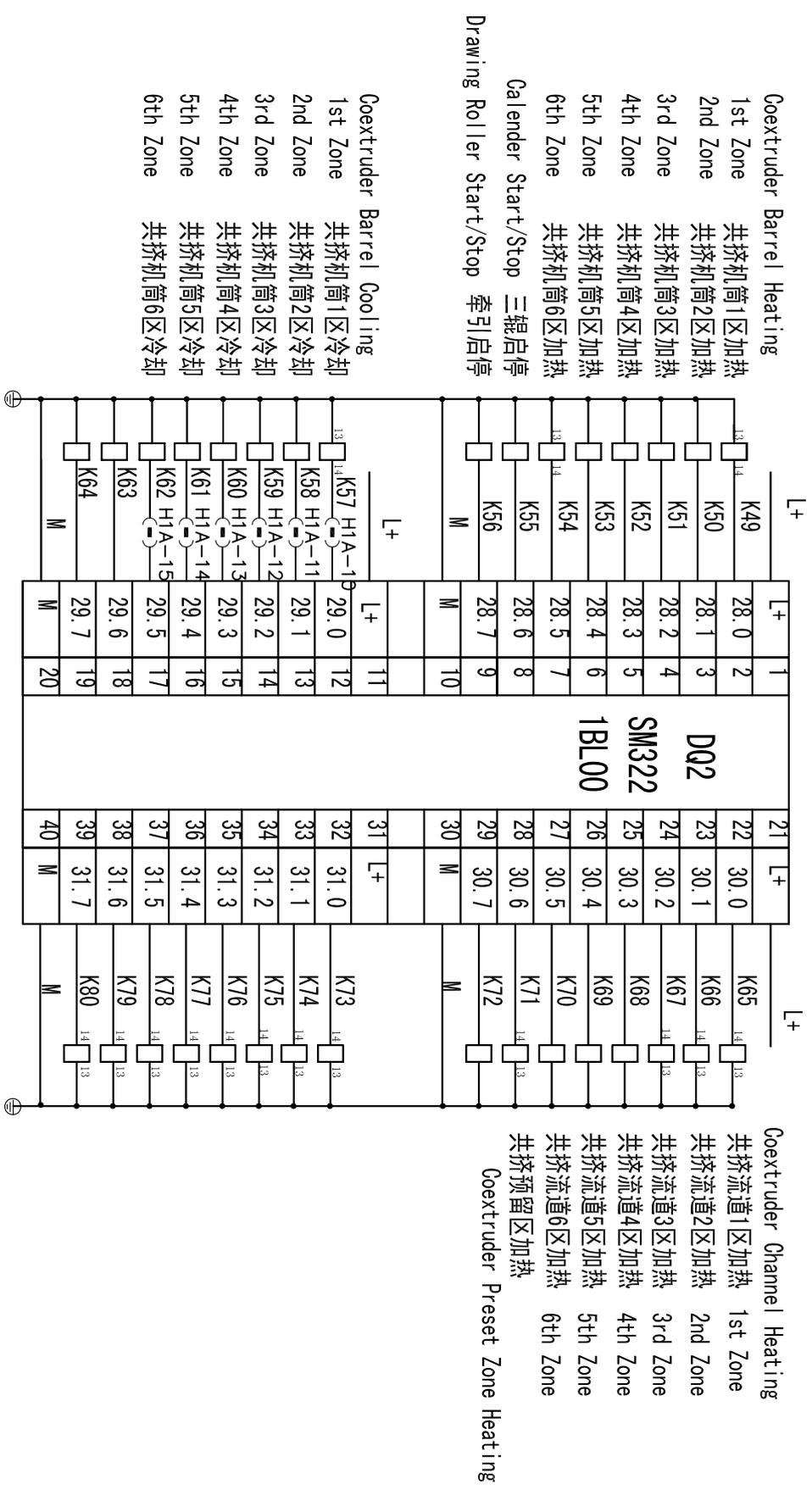


Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
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						ISSUED DATE
						SM331-5 Module
						12
						25 Apr'11 2005

A16



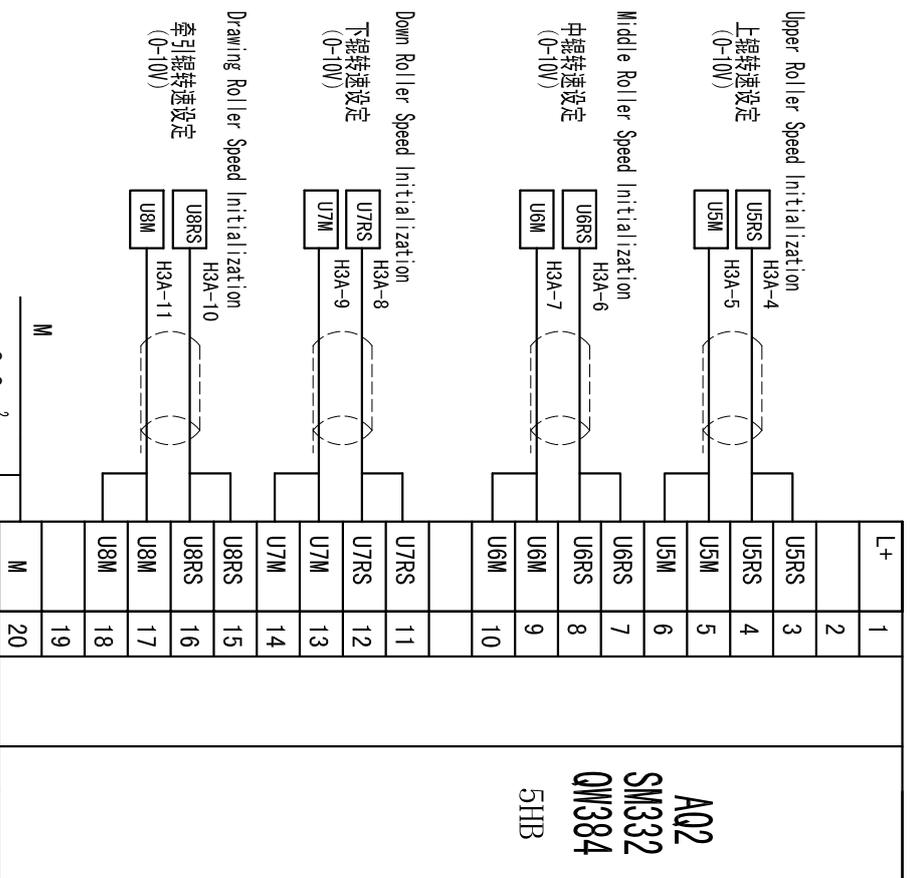
Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.	
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						ISSUED DATE
						SM331-6 Module
						13
						25 Apr'11 2005



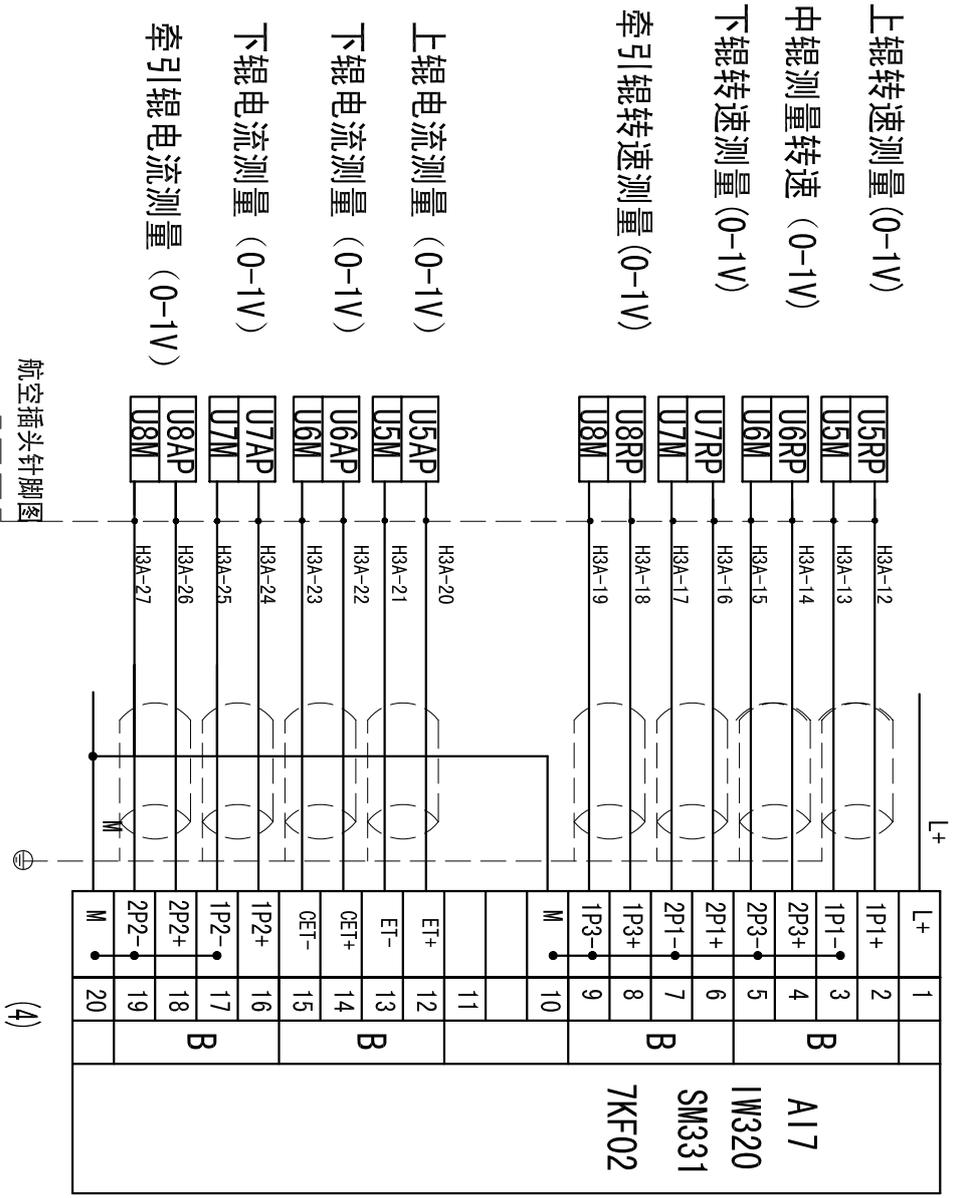
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3	SM322	28.2	23
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5		28.4	25
6		28.5	26
7		28.6	27
8		28.7	28
9	M	29.0	29
10		29.1	30
11	L+	29.2	31
12		29.3	32
13		29.4	33
14		29.5	34
15		29.6	35
16		29.7	36
17		29.7	37
18		29.7	38
19	M	29.7	39
20		29.7	40

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL PLATE & SHEET EQUIPMENT CO., LTD.		
			DESIGNED	APPROVED	SCALE	TITLE	SM332-2 Module
					NO	DRAWING NO.	14
						ISSUED DATE	25 Apr'11 2005





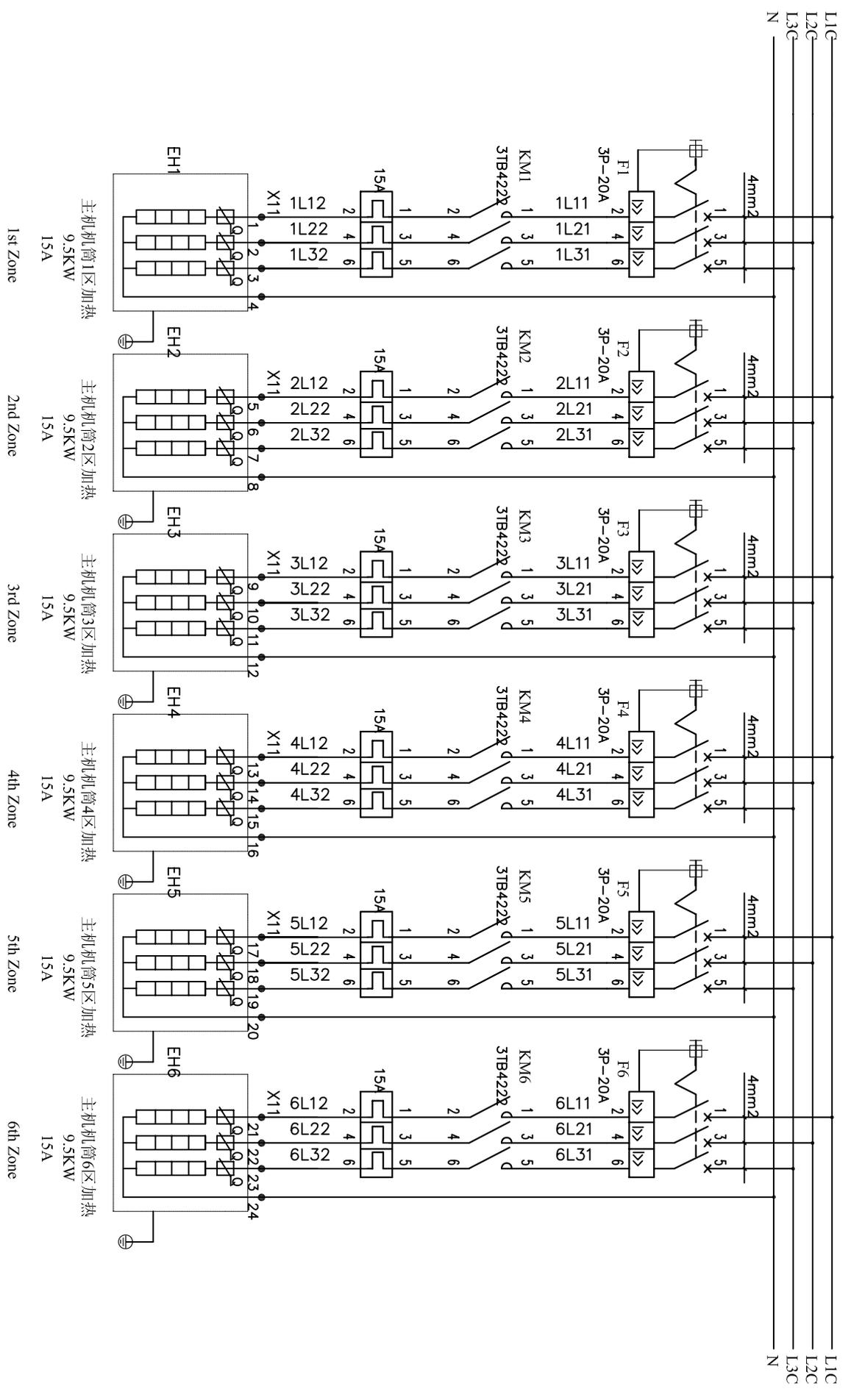
Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.		
			DESIGNED	APPROVED	SCALE	TITLE	SM332-2 Module
					NO	DRAWING NO.	16
						ISSUED DATE	25 Apr'11 2005



航空插头针脚图

Plug Sutral Drawing

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						25 Apr'11 2005
						SM331-7Module
						17



1st Zone 主机机筒1区加热 9.5KW 15A

2nd Zone 主机机筒2区加热 9.5KW 15A

3rd Zone 主机机筒3区加热 9.5KW 15A

4th Zone 主机机筒4区加热 9.5KW 15A

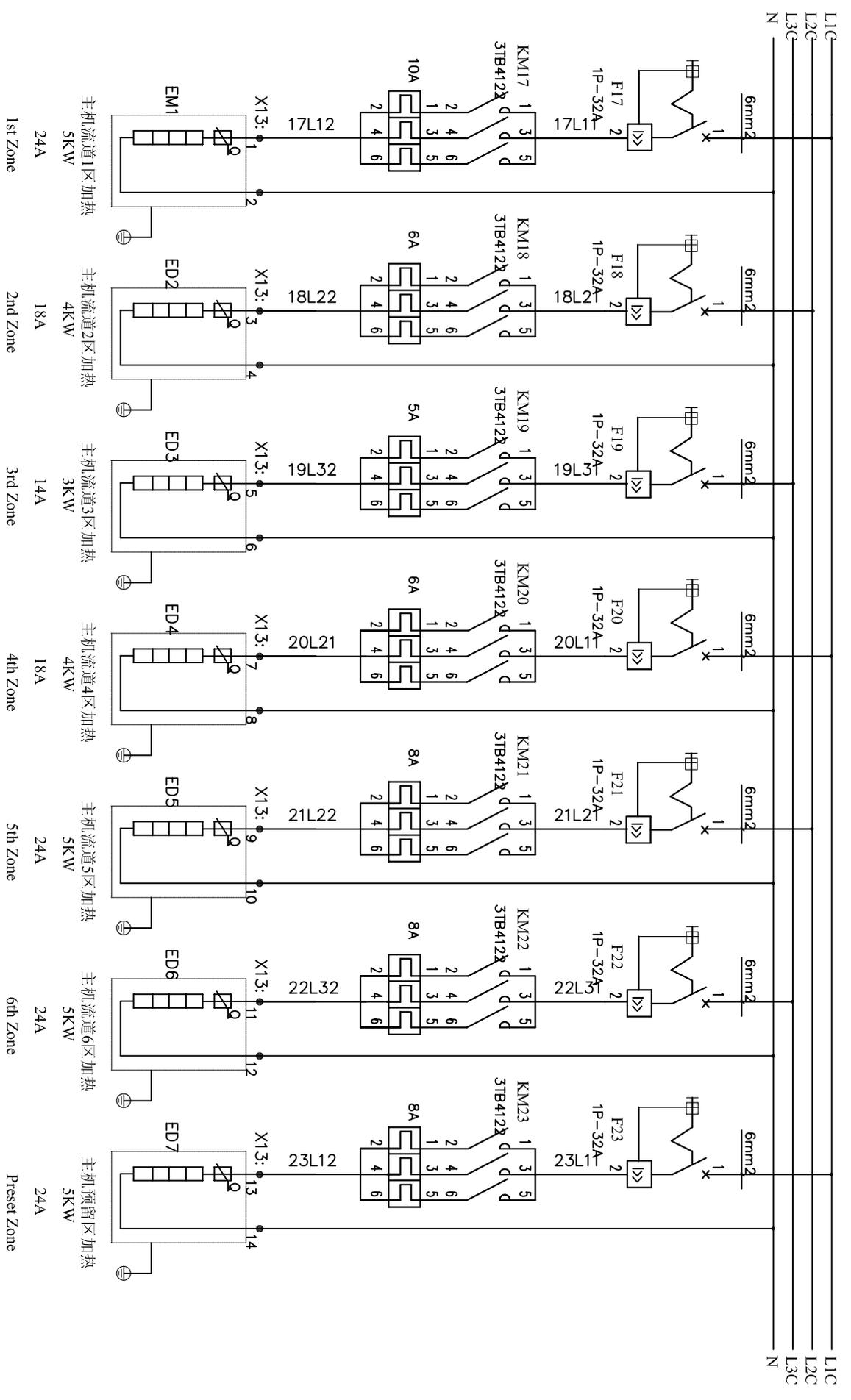
5th Zone 主机机筒5区加热 9.5KW 15A

6th Zone 主机机筒6区加热 9.5KW 15A

Rev.		Approved Date		Remarks		DRAWN		CHECKED		SHANGHAI JWEIL MACHINERY CO., LTD.	
DESIGNED		APPROVED								SCALE	
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										DRAWING NO.	
										ISSUED DATE	
										25 April 2005	

Main Extruder Barrel Heating Loop

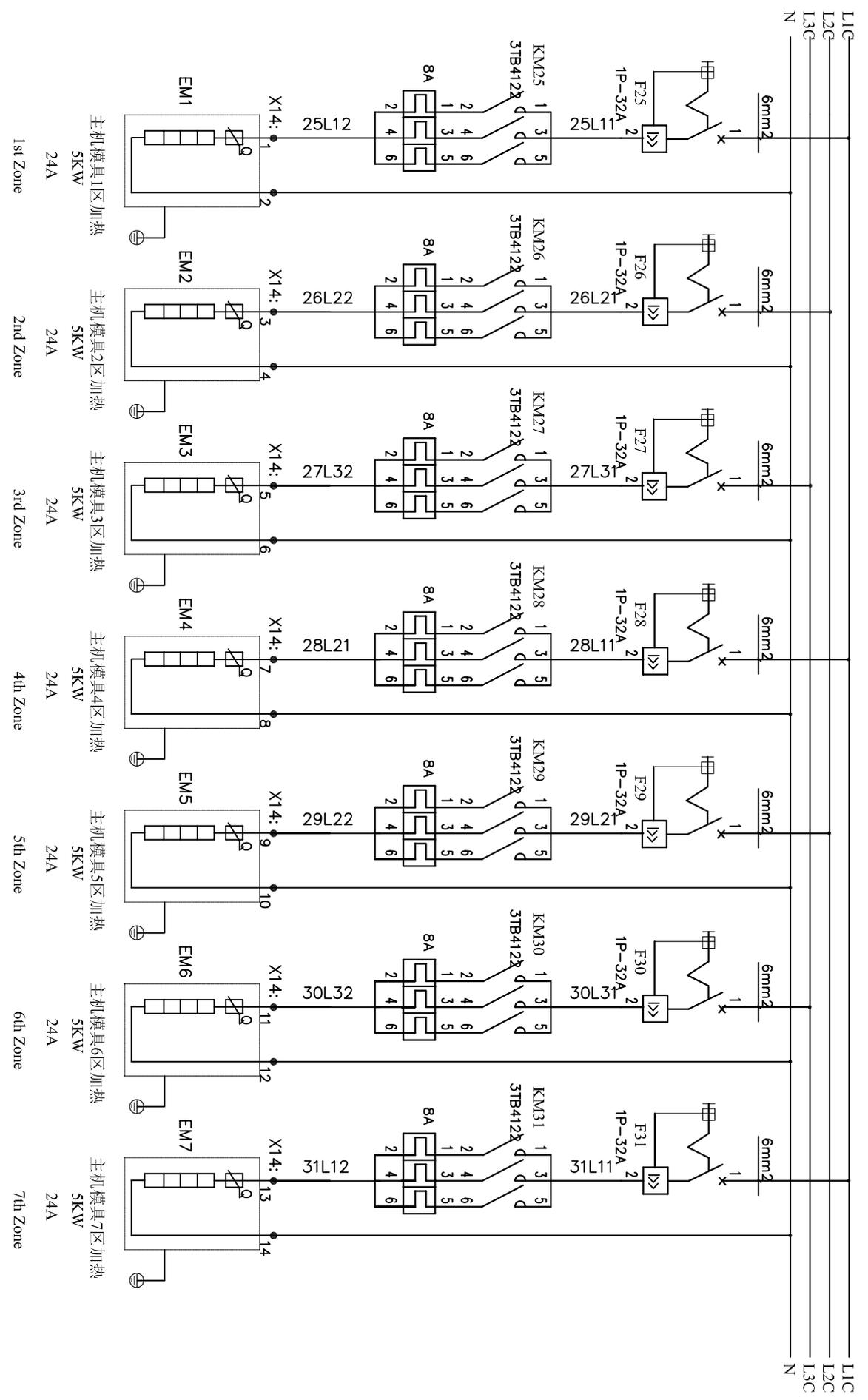
18



Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
					ISSUED DATE	25 April 2005
						Main Extruder Channel Heating Loop
						19

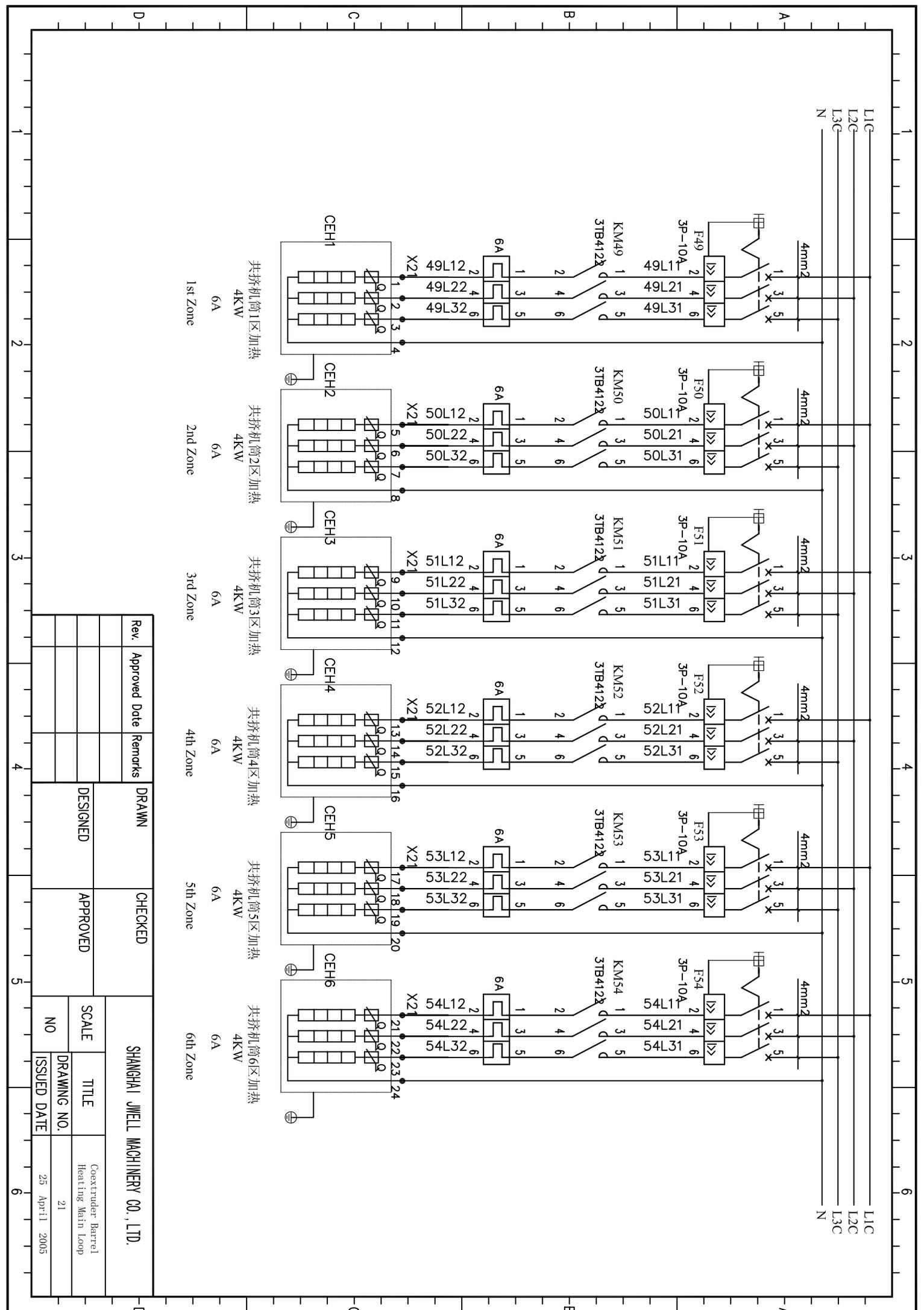
1 2 3 4 5 6

A B C D



Rev.	Approved Date	Remarks	DRAWN		CHECKED		SHANGHAI JWEIL MACHINERY CO., LTD.		
			DESIGNED		APPROVED		SCALE	TITLE	Main Extruder Die Heating Circuit
							NO	DRAWING NO.	
								ISSUED DATE	25 April 2005

1 2 3 4 5 6



共挤机筒1区加热  
4KW  
6A  
1st Zone

共挤机筒2区加热  
4KW  
6A  
2nd Zone

共挤机筒3区加热  
4KW  
6A  
3rd Zone

共挤机筒4区加热  
4KW  
6A  
4th Zone

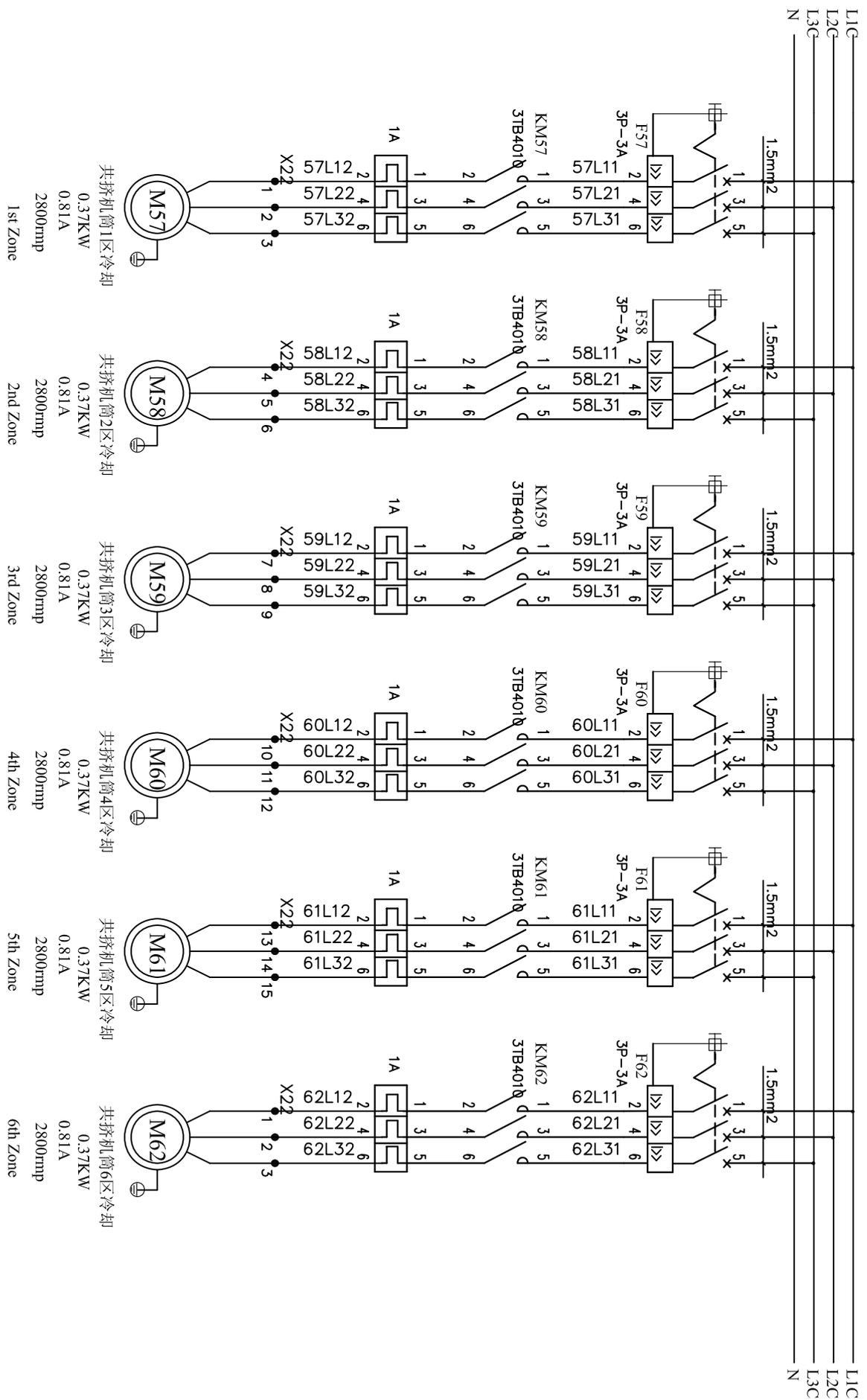
共挤机筒5区加热  
4KW  
6A  
5th Zone

共挤机筒6区加热  
4KW  
6A  
6th Zone

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
					ISSUED DATE	Coextruder Barrel Heating Main Loop
						21
						25 Apr 1 2005







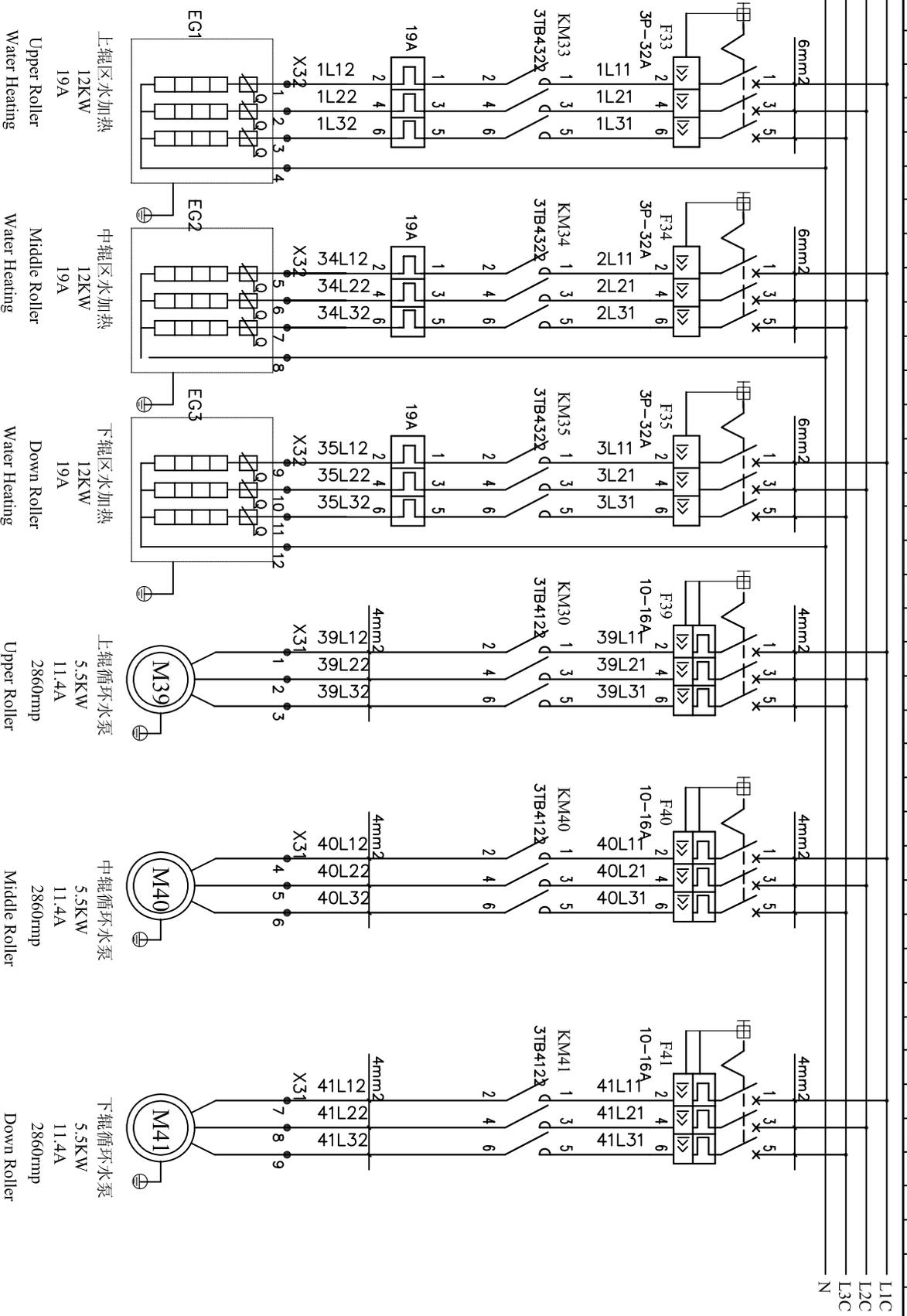
Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEILL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
					ISSUED DATE	Coextruder Barrel Cooling Loop
					25 April 2005	24

1 2 3 4 5 6

D C B A

1 2 3 4 5 6

D C B A



上辊区水加热  
12KW  
19A  
Upper Roller  
Water Heating

中辊区水加热  
12KW  
19A  
Middle Roller  
Water Heating

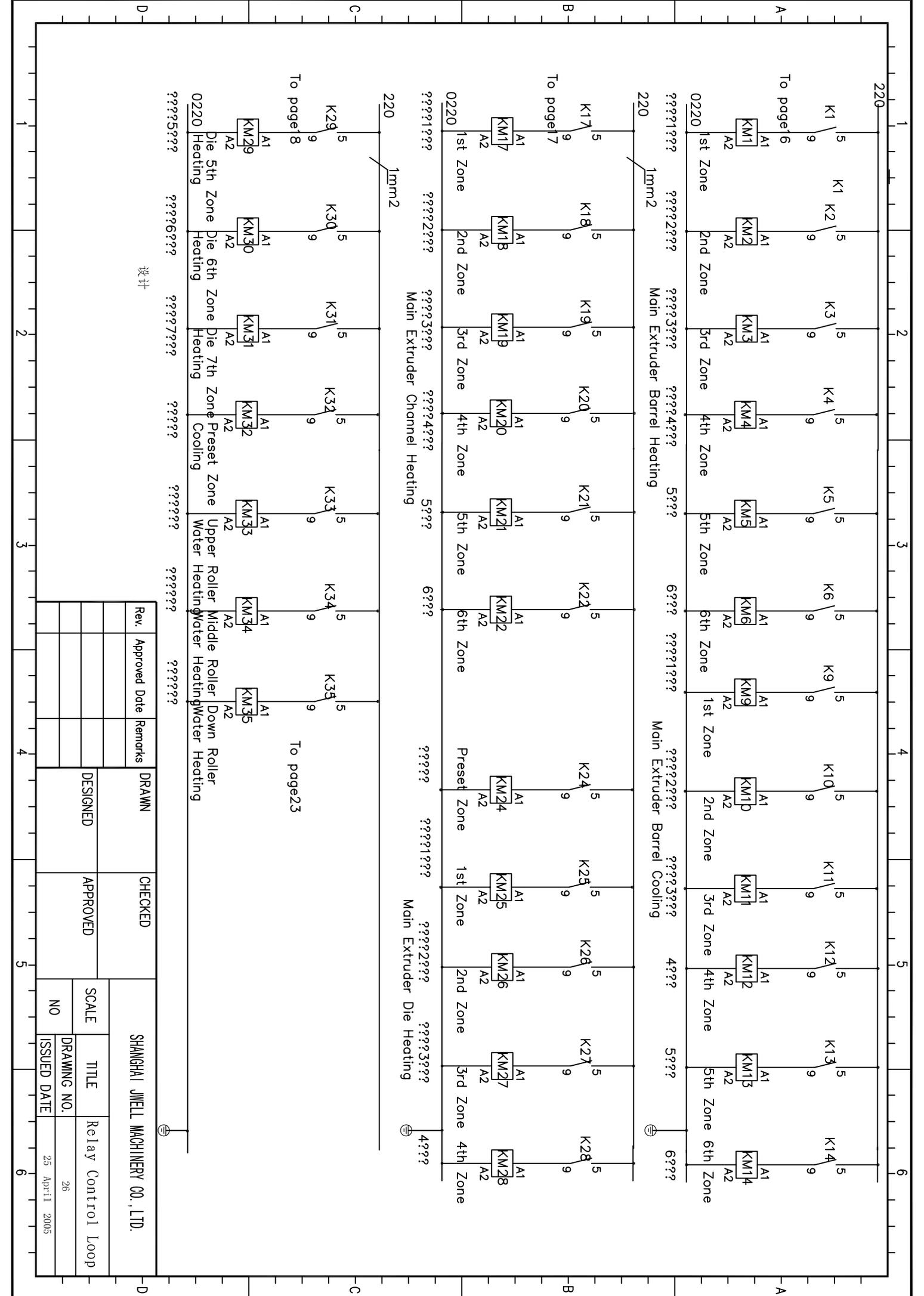
下辊区水加热  
12KW  
19A  
Down Roller  
Water Heating

上辊循环水泵  
5.5KW  
11.4A  
2860rpm  
Upper Roller  
Circulation Water Pump

中辊循环水泵  
5.5KW  
11.4A  
2860rpm  
Middle Roller  
Circulation Water Pump

下辊循环水泵  
5.5KW  
11.4A  
2860rpm  
Down Roller  
Circulation Water Pump

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWELL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					DRAWING NO.	Calendar Control Loop
					ISSUED DATE	25 Apr 11 2005

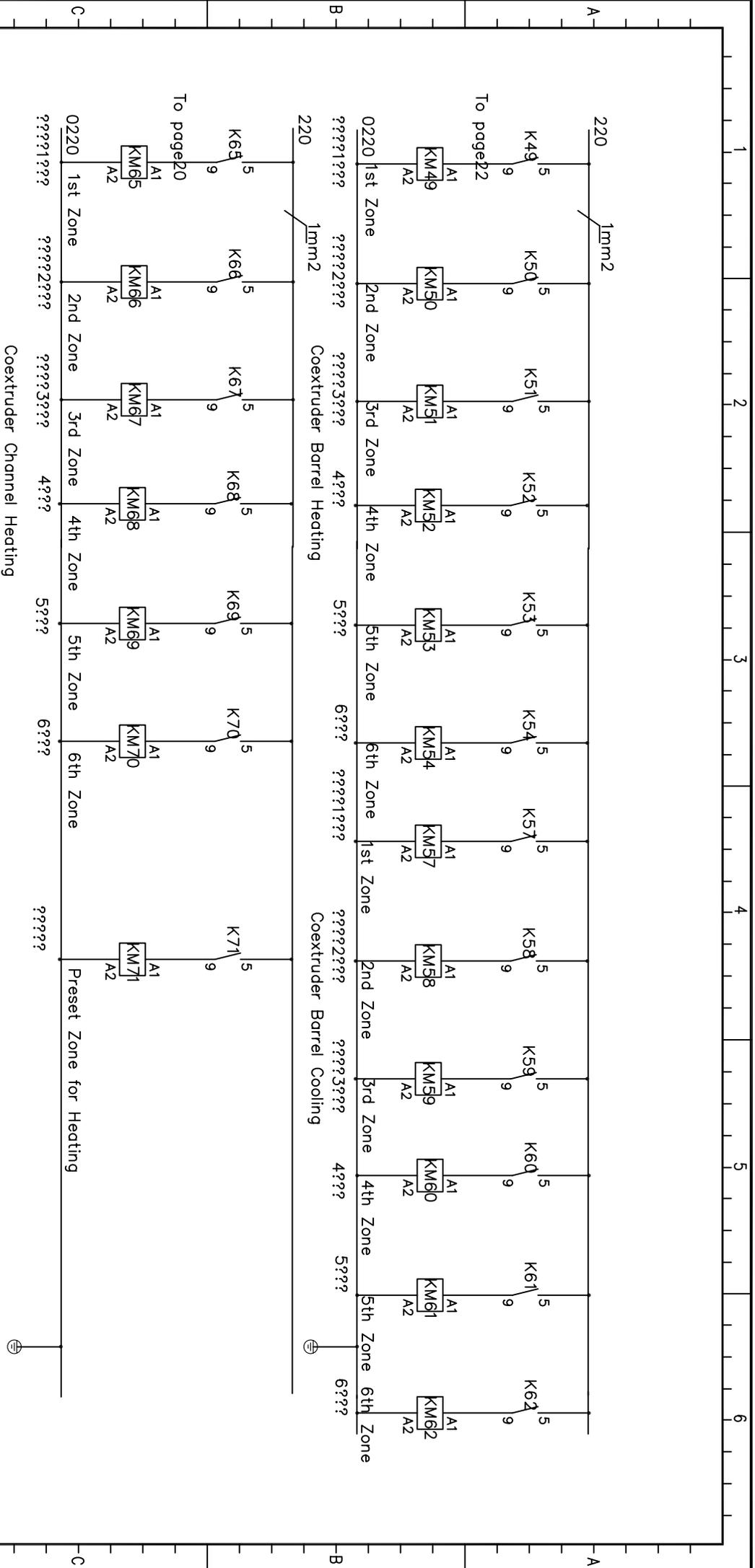


设计

SHANGHAI JWEILL MACHINERY CO., LTD.

Relay Control Loop

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SCALE	TITLE	Relay Control Loop
			DESIGNED	APPROVED	NO	DRAWING NO.	26
						ISSUED DATE	25 Apr'11 2005

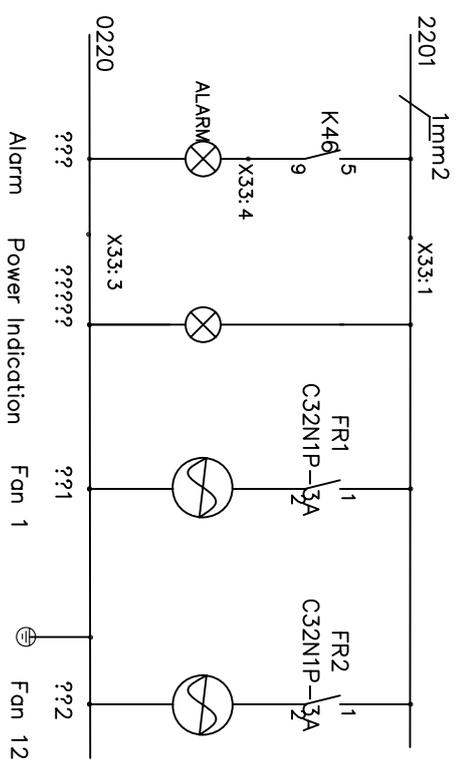
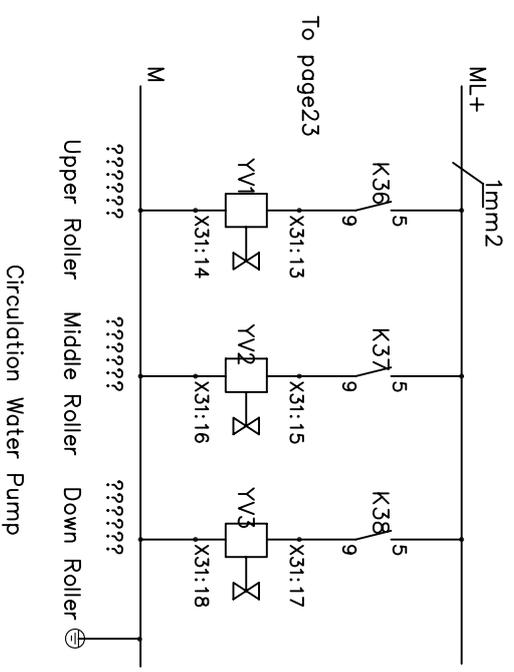
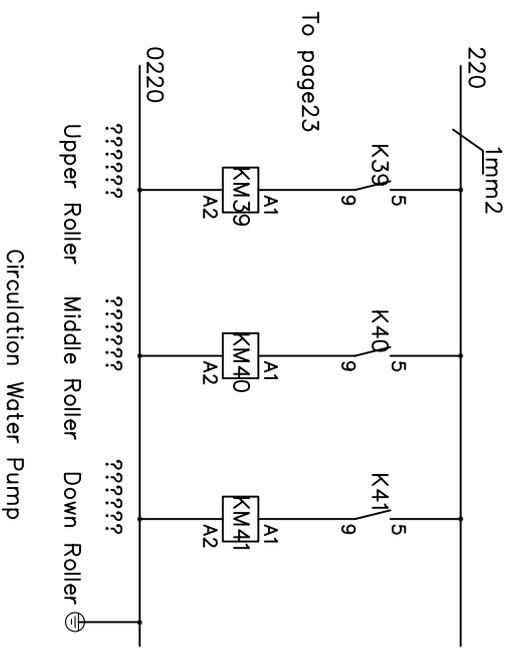


Coextruder Channel Heating

Coextruder Barrel Heating

Coextruder Barrel Cooling

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.		
			DESIGNED	APPROVED	SCALE	TITLE	Relay Control Loop
					NO	DRAWING NO.	27
						ISSUED DATE	25 Apr 11 2005



Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.		
			DESIGNED	APPROVED	SCALE	TITLE	Relay Control Loop
					NO	DRAWING NO.	28
						ISSUED DATE	25 Apr'11 2005

X10:			
1	EH1+	????1???	Main Extruder Barrel 1st Zone Temperature
2	EH1-		
3	EH2+	????2???	Main Extruder Barrel 2nd Zone Temperature
4	EH2-		
5	EH3+	????3???	Main Extruder Barrel 3rd Zone Temperature
6	EH3-		
7	EH4+	????4???	Main Extruder Barrel 4th Zone Temperature
8	EH4-		
9	EH5+	????5???	Main Extruder Barrel 5th Zone Temperature
10	EH5-		
11	EH6+	????6???	Main Extruder Barrel 6th Zone Temperature
12	EH6-		
13	ED1+	????1???	Main Extruder Channel 1st Zone Temperature
14	ED1-		
15	ED2+	????2???	Main Extruder Channel 2nd Zone Temperature
16	ED2-		
17	ED3+	????3???	Main Extruder Channel 3rd Zone Temperature
18	ED3-		
19	ED4+	????4???	Main Extruder Channel 4th Zone Temperature
20	ED4-		
21	ED5+	????5???	Main Extruder Channel 5th Zone Temperature
22	ED5-		
23	ED6+	????6???	Main Extruder Channel 6th Zone Temperature
24	ED6-		
25	ED7+	???????	Main Extruder Preset Zone Temperature
26	ED7-		
27	EM1+	??1???	Main Extruder Die 1st Zone Temperature
28	EM1-		
29	EM2+	??2???	Main Extruder Die 2nd Zone Temperature
30	EM2-		
31	EM3+	??3???	Main Extruder Die 3rd Zone Temperature
32	EM3-		
33	EM4+	??4???	Main Extruder Die 4th Zone Temperature
34	EM4-		
35	EM5+	??5???	Main Extruder Die 5th Zone Temperature
36	EM5-		
37	EM6+	??6???	Main Extruder Die 6th Zone Temperature
38	EM6-		
39	EM7+	??7???	Main Extruder Die 7th Zone Temperature
40	EM7-		

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED		
					NO	DRAWING NO.
					ISSUED DATE	Main Extruder Terminal 1
					25 Apr 1 2005	29

X11:		
1	1L12	Main Extruder Barrel 1st Zone Heating
2	1L22	????1???
3	1L32	
4	2L12	Main Extruder Barrel 2nd Zone Heating
5	2L22	????2???
6	2L32	
7	3L12	Main Extruder Barrel 3rd Zone Heating
8	3L22	????3???
9	3L32	
10	4L12	Main Extruder Barrel 4th Zone Heating
11	4L22	????4???
12	4L32	
13	5L12	Main Extruder Barrel 5th Zone Heating
14	5L22	????5???
15	5L32	
16	6L12	Main Extruder Barrel 6th Zone Heating
17	6L22	????6???
18	6L32	
19		

X12:		
1	9L12	Main Extruder Barrel 1st Zone Cooling
2	9L22	????1???
3	9L32	
4	PE	
5	10L12	Main Extruder Barrel 2nd Zone Cooling
6	10L22	????2???
7	10L32	
8	PE	
9	11L12	Main Extruder Barrel 3rd Zone Cooling
10	11L22	????3???
11	11L32	
12	PE	
13	12L12	Main Extruder Barrel 4th Zone Cooling
14	12L22	????4???
15	12L32	
16	PE	
17	13L12	Main Extruder Barrel 5th Zone Cooling
18	13L22	????5???
19	13L32	
20	PE	
21	14L12	Main Extruder Barrel 6th Zone Cooling
22	14L22	????6???
23	14L32	
24	PE	

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
					ISSUED DATE	Main Extruder Terminal 2
					25 Apr 1 2005	30



X30:	
1	EG1+
2	EG1-
3	EG2+
4	EG2-
5	EG3+
6	EG3-

????? Upper Roller Temperature

????? Middle Roller Temperature

????? Down Roller Temperature

X31:	
1	39L12
2	39L22
3	39L32
4	PE
5	40L12
6	40L22
7	40L32
8	PE
9	41L12
10	41L22
11	41L32
12	PE
13	K36-9
14	O220
15	K37-9
16	O220
17	K38-9
18	O220

??????? Upper Roller Circulation Water Pump

??????? Middle Roller Circulation Water Pump

??????? Dwon Roller Circulation Water Pump

??????? Upper Roller Water Cooling

??????? Middle Roller Water Cooling

??????? Down Roller Water Cooling

X32:	
1	33L12
2	33L22
3	33L32
4	34L12
5	34L22
6	34L32
7	35L12
8	35L22
9	35L32
10	PE
11	M
12	

??????? Upper Roller Water Heating

??????? Middle Roller Water Heating

??????? Down Roller Water Heating

Rev.	Approved Date	Remarks

DRAWN	DESIGNED	CHECKED	APPROVED
SHANGHAI JIWEI MACHINERY CO., LTD.			
SCALE	TITLE	Main Extruder Terminals 4	
NO	DRAWING NO.	32	
	ISSUED DATE	25 April 2005	

X20:			
1	CEH1+	????1???	Coextruder Barrel 1st Zone Temperature
2	CEH1-		
3	CEH2+	????2???	Coextruder Barrel 2nd Zone Temperature
4	CEH2-		
5	CEH3+	????3???	Coextruder Barrel 3rd Zone Temperature
6	CEH3-		
7	CEH4+	????4???	Coextruder Barrel 4th Zone Temperature
8	CEH4-		
9	CEH5+	????5???	Cextruder Barrel 5th Zone Temperature
10	CEH5-		
11	CEH6+	????6???	Coextruder Barrel 6th Zone Temperature
12	CEH6-		
13	CED1+	????1???	Coextruder Channel 1st Zone Temperature
14	CED1-		
15	CED2+	????2???	Coextruder Channel 2nd Zone Temperature
16	CED2-		
17	CED3+	????3???	Coextruder Channel 3rd Zone Temperature
18	CED3-		
19	CED4+	????4???	Coextruder Channel 4th Zone Temperature
20	CED4-		
21	CED5+	????5???	Coextruder Channel 5th Zone Temperature
22	CED5-		
23	CED6+	????6???	Coextruder Channel 6th Zone Temperature
24	CED6-		
25	CED7+	????7???	Coextruder Preset Zone Temperature
26	CED7-		

X21:			
1	49L12		
2	49L22	????1???	Coextruder Barrel 1st Zone Heating
3	49L32		
4	50L12		
5	50L22	????2???	Coextruder Barrel 2nd Zone Heating
6	50L32		
7	51L12		
8	51L22	????3???	Coextruder Barrel 3rd Zone Heating
9	51L32		
10	52L12		
11	52L22	????4???	Coextruder Barrel 4th Zone Heating
12	52L32		
13	53L12		
14	53L22	????5???	Coextruder Barrel 5th Zone Heating
15	53L32		
16	54L12		
17	54L22	????6???	Coextruder Barrel 6th Zone Heating
18	54L32		
19			

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
					ISSUED DATE	Coextruder Terminals 1
					25 Apr 1 2005	33



A	H1A	YD40-308re	PE 1	PE	
			L+ 2	L+	
			M 3	M	
			U1RS 4	??????	
			U1M 5		
			U1AP 6	??????	
			U1RP 7	??????	
			K42-8B	????	
			K42-9B	????	
B			L+ 10		
			L+ 11		
			U2RS 12	??????	
			U2AP 13	??????	
			U2RS 14	??????	
			U2M 15		
			U2AP 16	??????	
			U2RP 17	??????	
			K43-5B	??????	
			K43-9B	??????	
C			L+ 20		
			U3RS 21	??????	
			U3AP 22	??????	
			U3RS 23	??????	
			U3AP 24	??????	
			U3M 25		
			U3AP 26	??????	
			U3RP 27	??????	
			K43-8B	??????	
			K43-12B	??????	
D			L+ 28		
			L+ 29		
			L+ 30		
			L+ 31		
			U4RS 32	??????	
			U4AP 33	??????	
			U4RS 34	??????	
			U4M 35		
			U4AP 36	??????	
			U4RP 37	??????	
			K44-5B	??????	

Main Extruder

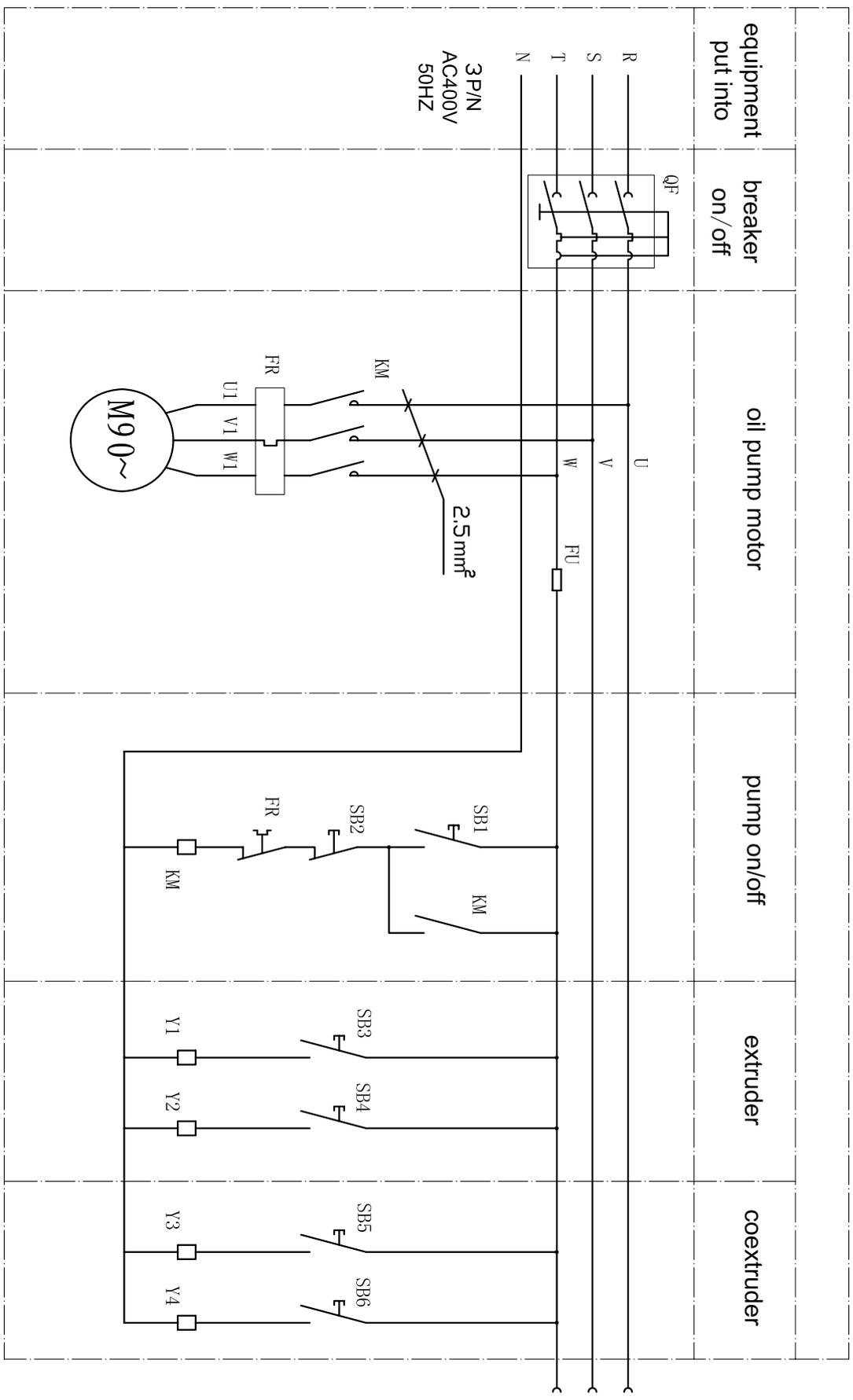
A	H2A	YD40-308re	PE 1	PE	
			L+ 2	L+	
			M 3	M	
			U3RS 4	??????	
			U3M 5		
			U3AP 6	??????	
			U3RP 7	??????	
			K44-5B	????	
			K44-9B	????	
B			L+ 10		
			L+ 11		
			U4RS 12	??????	
			U4AP 13	??????	
			U4RS 14	??????	
			U4M 15		
			U4AP 16	??????	
			U4RP 17	??????	
			K45-5B	??????	
			K45-9B	??????	
C			L+ 20		
			U5RS 21	??????	
			U5AP 22	??????	
			U5RS 23	??????	
			U5AP 24	??????	
			U5M 25		
			U5AP 26	??????	
			U5RP 27	??????	
			K45-8B	??????	
			K45-12B	??????	
D			L+ 28		
			L+ 29		
			L+ 30		
			L+ 31		
			U6RS 32	??????	
			U6AP 33	??????	
			U6RS 34	??????	
			U6M 35		
			U6AP 36	??????	
			U6RP 37	??????	
			K44-2B	??????	

Coextruder

A	H3A	YD40-308re	PE 1	PE	
			L+ 2	L+	
			M 3	M	
			U5RS 4	??????	
			U5M 5		
			U6RS 6	??????	
			U6M 7		
			U7RS 8	??????	
			U7M 9		
			U8RS 10	??????	
			U8M 11		
B			L+ 12		
			L+ 13		
			U5RS 14	??????	
			U5AP 15	??????	
			U5RS 16	??????	
			U5M 17		
			U5AP 18	??????	
			U5RP 19	??????	
			K44-19B	??????	
			K44-20B	??????	
C			L+ 20		
			U6RS 21	??????	
			U6AP 22	??????	
			U6RS 23	??????	
			U6AP 24	??????	
			U6M 25		
			U6AP 26	??????	
			U6RP 27	??????	
			K45-28B	??????	
			K45-29B	??????	
D			L+ 28		
			L+ 29		
			L+ 30		
			L+ 31		
			U7RS 32	??????	
			U7AP 33	??????	
			U7RS 34	??????	
			U7M 35		
			U7AP 36	??????	
			U7RP 37	??????	
			K45-31B	??????	

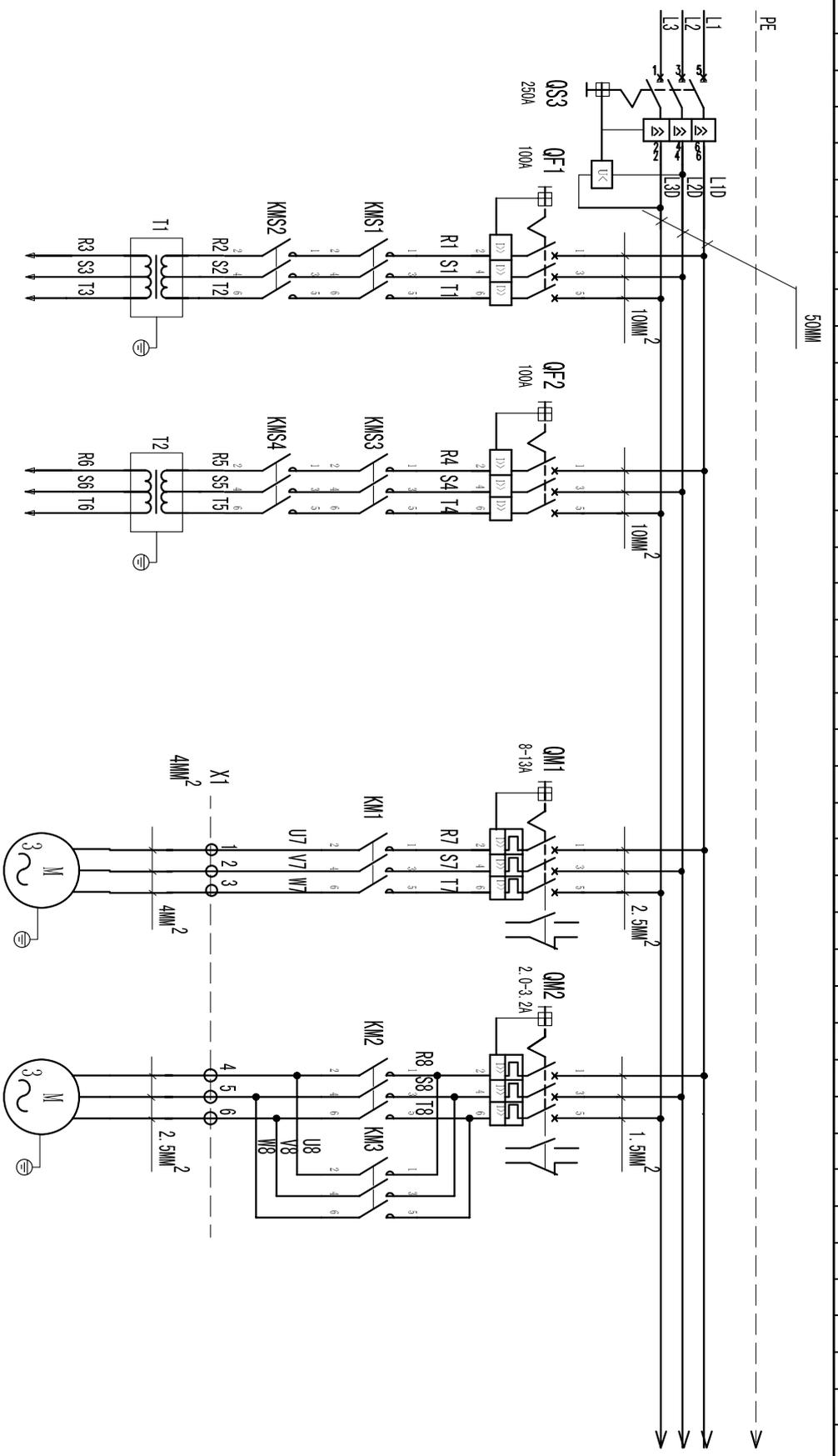
Rev.	Approved Date	Remarks	DRAWN		CHECKED		SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED		APPROVED		SCALE	TITLE
							NO	DRAWING NO.
								ISSUED DATE
								25 April 2005
								Plug Terminal Chart 1
								35

1 2 3 4 5 6



3KW  
6A  
1440RPM  
50HZ

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEILL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						HYDRAULIC SCREEN CHANGER CONTROL DRAWING
						36
						25 Apr'11 2005

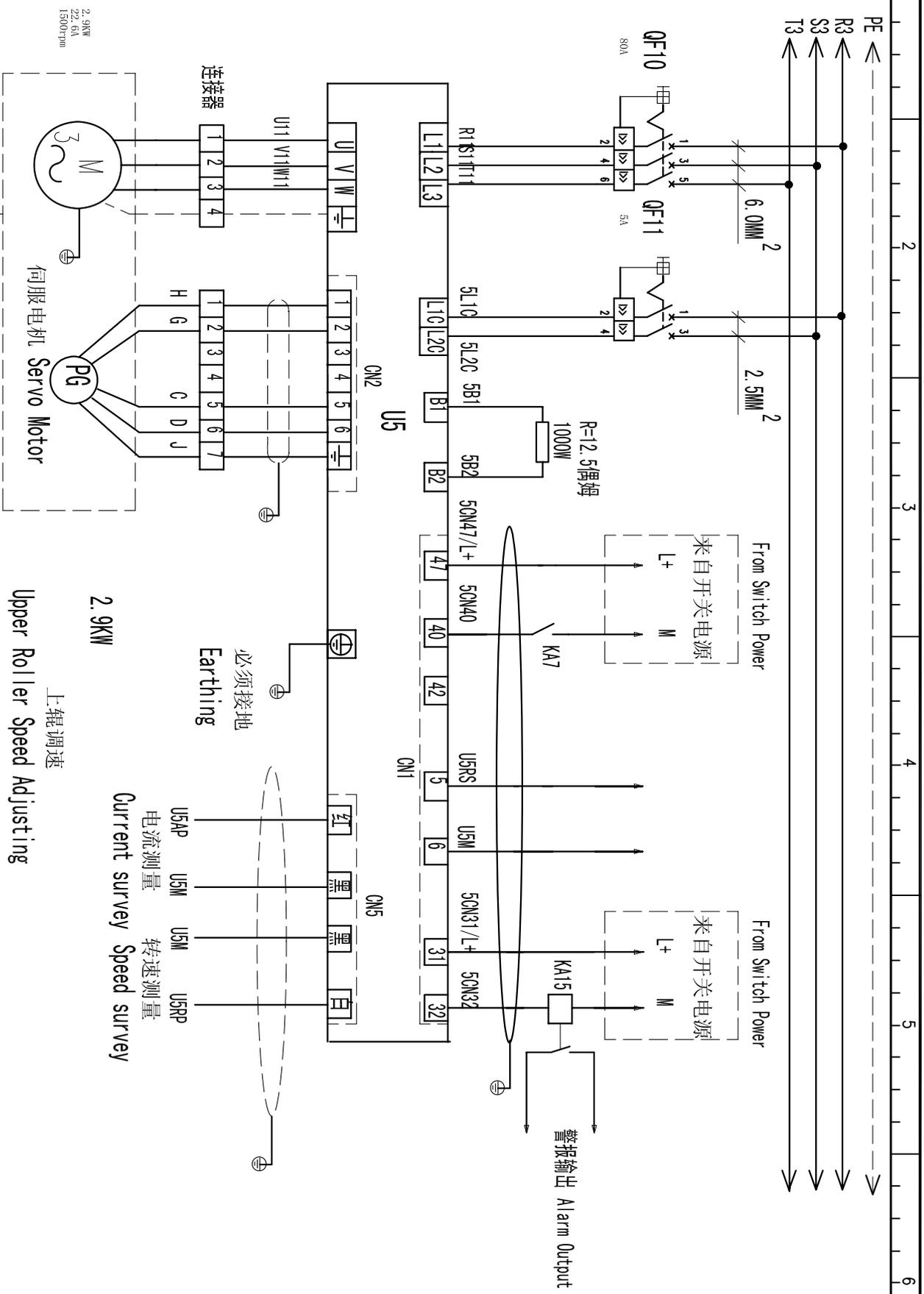


上辊+中辊伺服电源 30KVVA 下辊+牵引辊伺服电源 30KVVA  
 Upper Roller-Middle Roller Servo Power 30KW Down Roller-Drawing Roller Servo Power 30KW  
 三辊液压泵 三辊纵进/纵退  
 Three Roller Hydraulic Pump Three Roller Fore/After  
 5.5KW 0.75KW  
 11.3A 2.03A  
 2880rpm 1380rpm

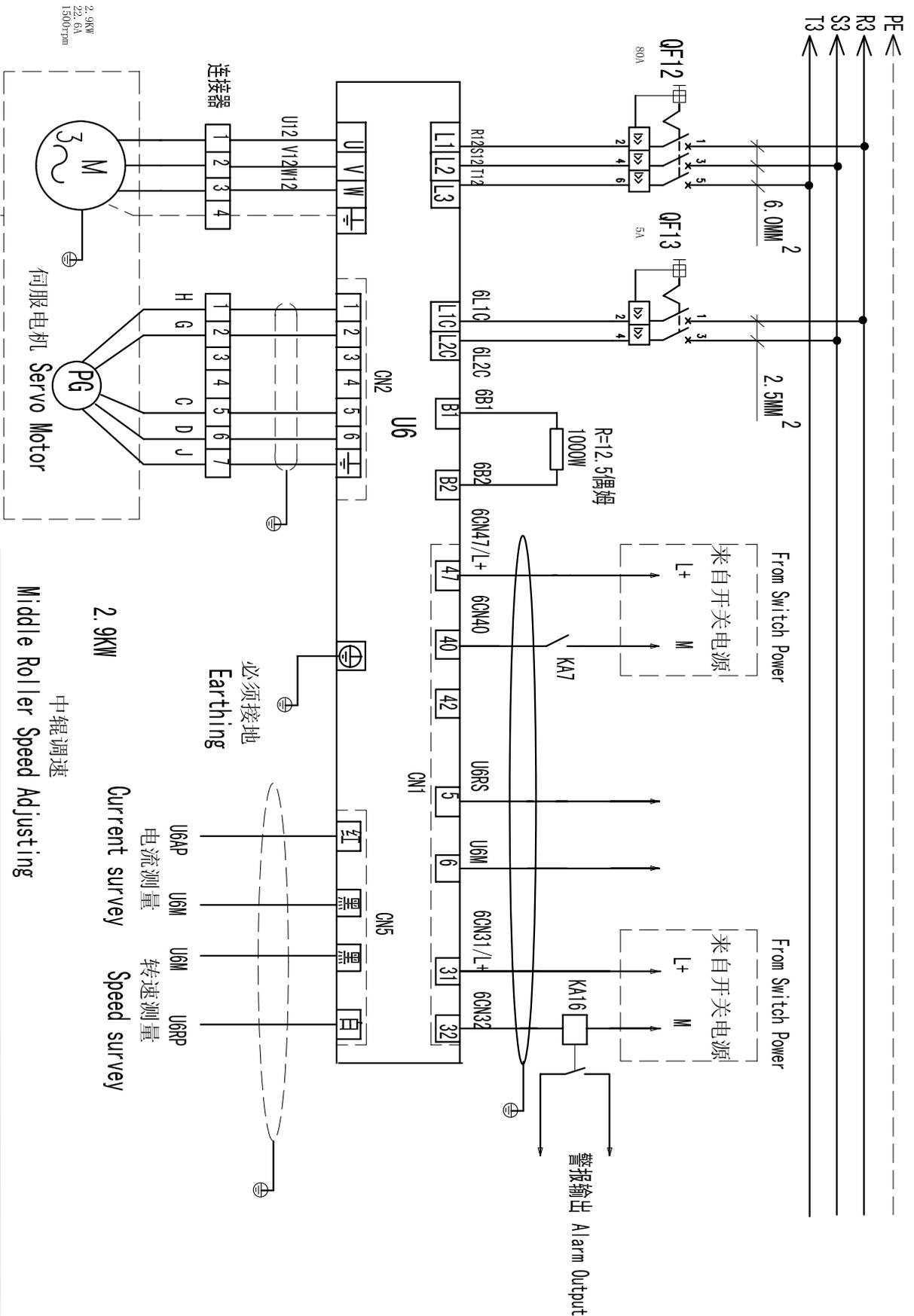
Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	Down Stream Main Loop Circuit
					DRAWING NO.	37
					ISSUED DATE	25 Apr'11 2005

1 2 3 4 5 6



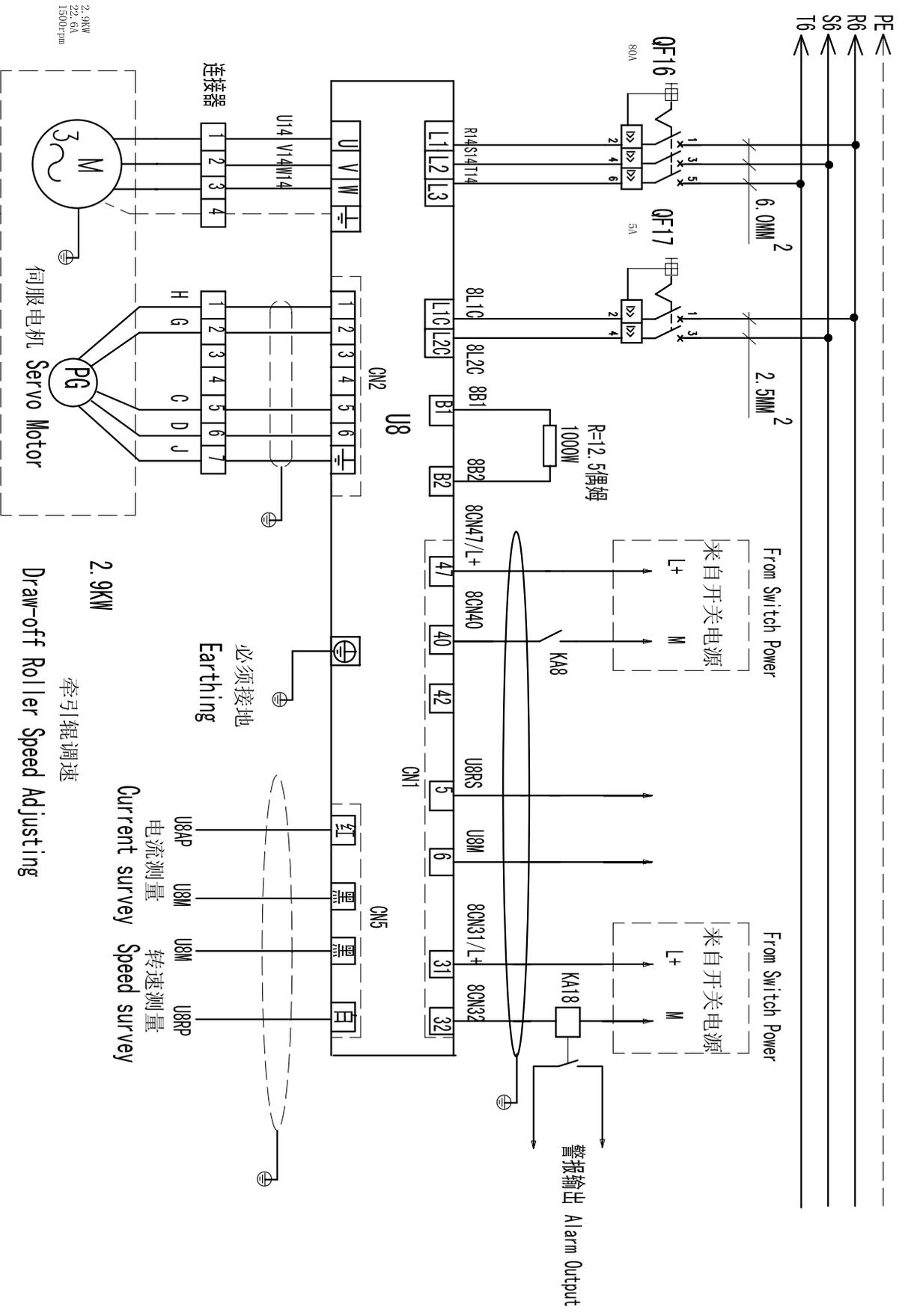


Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
					ISSUED DATE	Upper Roller Main Circuit
						39
						25 Apr-11 2005



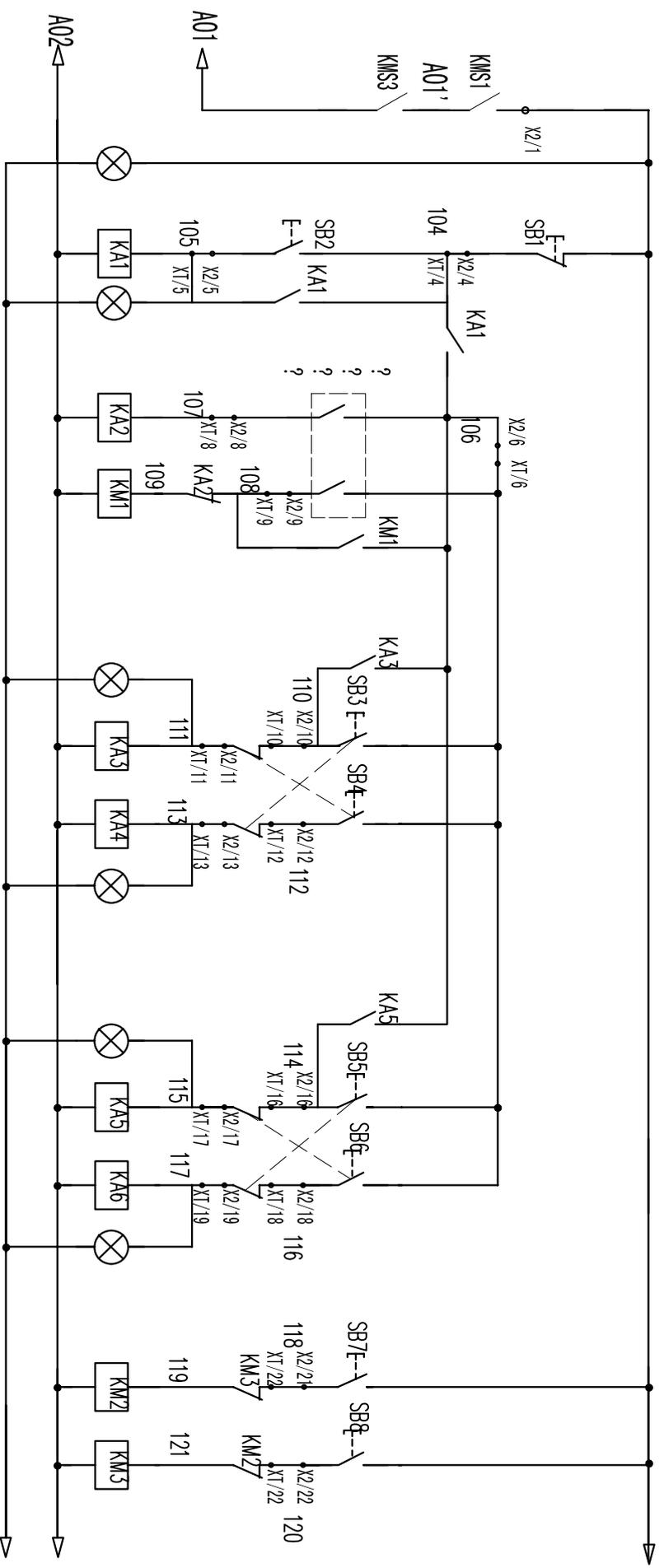
Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	Middle Roller Main Circuit
					DRAWING NO.	40
					ISSUED DATE	25 Apr-11 2005





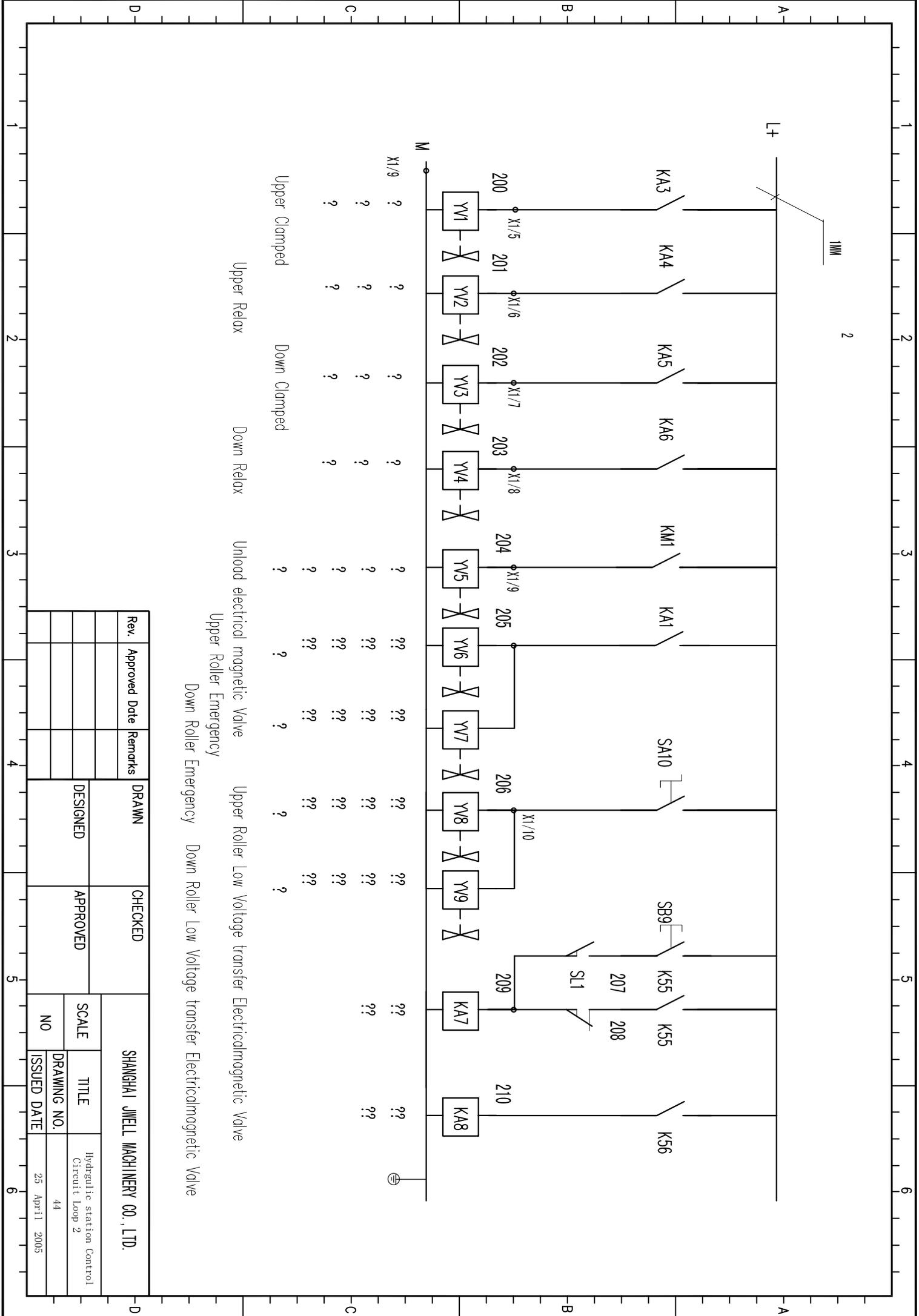
Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	Draw-off Roller Main Circuit
					ISSUED DATE	DRAWING NO.
					25 Apr'11 2005	42

电源指示 液压泵启动 压力上限 压力下限 上辊合拢 上辊分开 下辊合拢 下辊分开 纵进 纵退  
 Power Indication Hydraulic Pump Start Max Pressure Min Pressure Upper Roller Clamped Upper Roller Separate Down Roller Clamped Down Roller Separate Forward Backward  
 三辊机 Galender



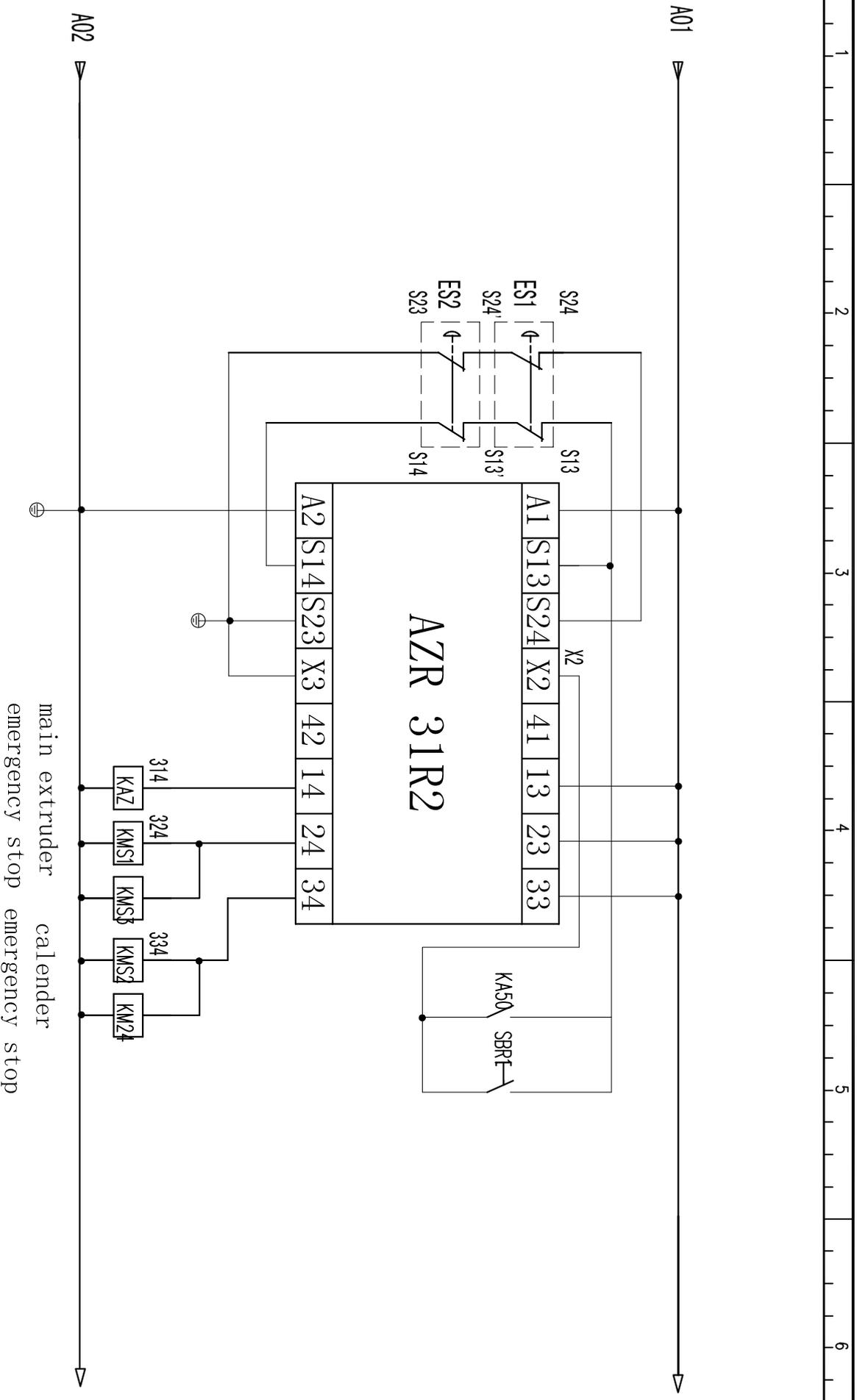
100

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEIL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	Hydraulic Station Control
					ISSUED DATE	43
						25 Apr'11 2005



Upper Clamped      Down Clamped      Upper Relax      Down Relax      Unload electrical magnetic Valve      Upper Roller Emergency      Down Roller Emergency      Upper Roller Low Voltage transfer Electricalmagnetic Valve      Down Roller Low Voltage transfer Electricalmagnetic Valve

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JIWEI MACHINERY CO., LTD.		
			DESIGNED	APPROVED	SCALE	TITLE	Hydraulic station Control Circuit Loop 2
					NO	DRAWING NO.	
						ISSUED DATE	25 April 2005



Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEILL MACHINERY CO., LTD.		
			DESIGNED	APPROVED	SCALE	TITLE	relay controlling
					NO	DRAWING NO.	45
						ISSUED DATE	25 Apr'11 2005

X1  
4MM<sup>2</sup>

	U7	1
	V7	2
	W7	3
		4
液压泵		5
上夹紧电磁阀YV1	200	5
上放松电磁阀YV2	201	6
下夹紧电磁阀YV3	202	7
下放松电磁阀YV4	203	8
卸压电磁阀YV5	204	9
上下分开电磁阀YV7, YV8	205	10
上下压力转换电磁阀YV8, YV9	206	11
		12
	U8	13
纵进/纵退电机	V8	14
	W8	15
		16
		17
	R10	18
收卷机电源	S10	19
	T10	20
		21
		22
		23
		24

10MM<sup>2</sup>

(辅机主电路部分)  
(Downstream Main Electrical Circuit)

X2  
(辅机电柜内)  
2.5MM<sup>2</sup>

	S13	1
	S14	2
	S23	3
	S24	4
	100	5
	A02	6
	104	7
	105	8
	106	9
	107	10
	108	11
	110	12
	111	13
	112	14
	113	15
	114	16
	115	17
	116	18
	117	19
	103	20
	118	21
	120	22
	L+	23
	206	24
		25
		26
		27
		28
		29
		30
		31
		32
		33
		34
		35
		36
		37
		38
		39
		40
		41
		42
		43
		44
		45

去辅机操作箱  
To Downstream Operating Cabinet

X1  
(辅机操作箱内)  
2.5MM<sup>2</sup>

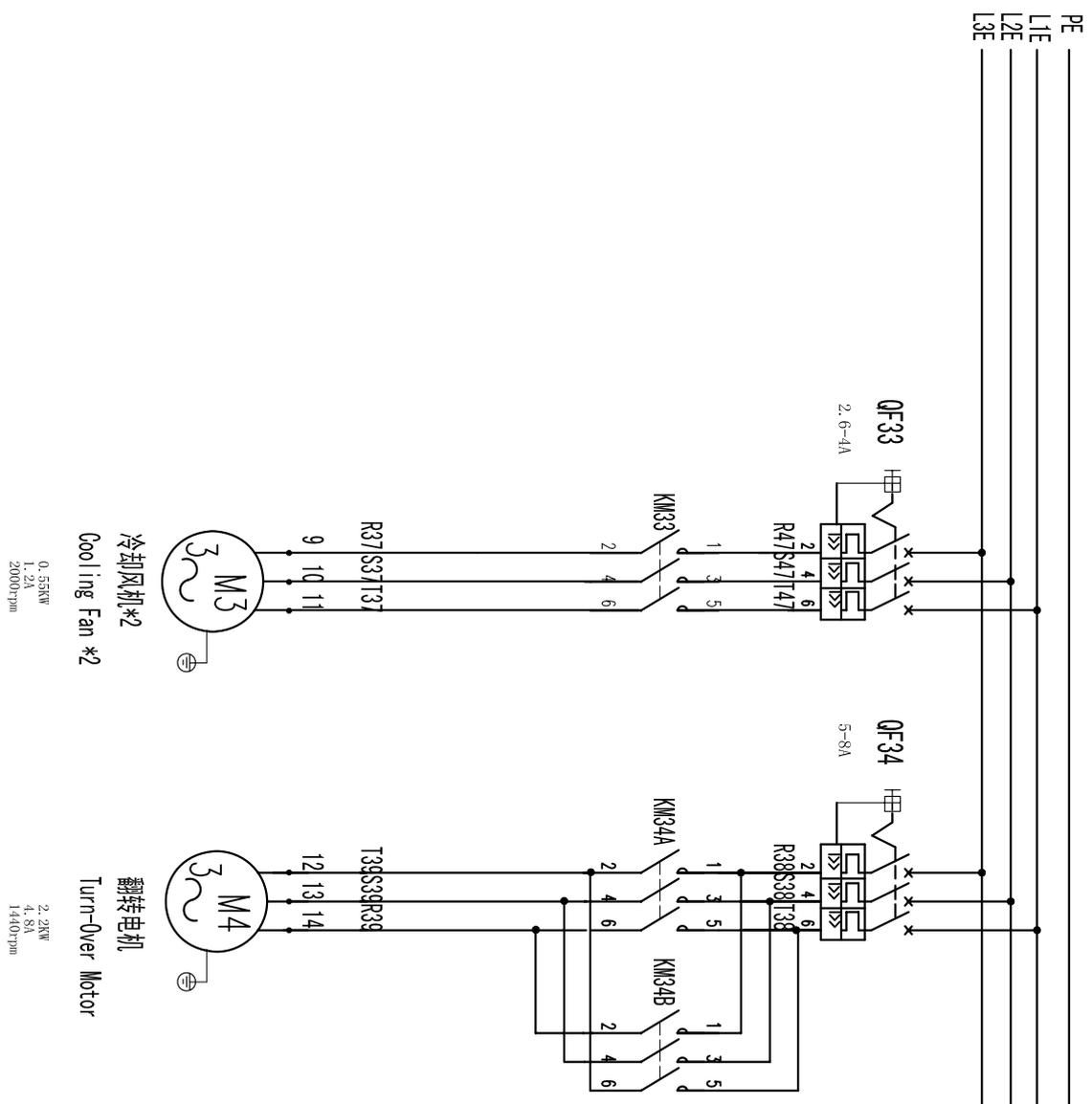
	S13	1
	S14	2
	S23	3
	S24	4
	100	5
	A02	6
	104	7
	105	8
	106	9
	107	10
	108	11
	110	12
	111	13
	112	14
	113	15
	114	16
	115	17
	116	18
	117	19
	103	20
	118	21
	120	22
	L+	23
	206	24
		25
		26
		27
		28
		29
		30
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去辅机主电柜  
To Downstream Main Electrical Cabinet

(Downstream Control Cabinet)

Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JUELL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
					ISSUED DATE	25 Apr'11 2005
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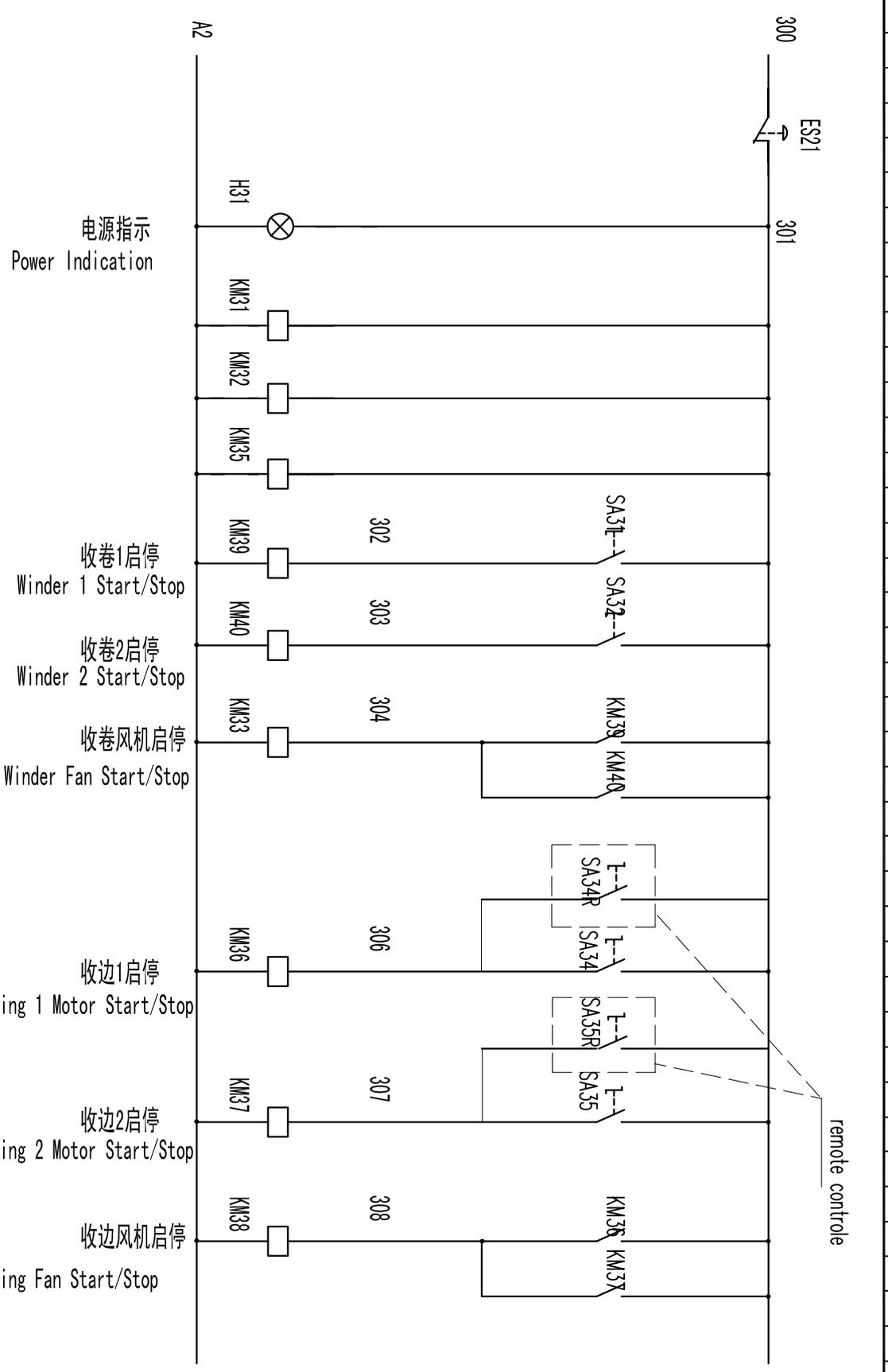




Rev.	Approved Date	Remarks	DRAWN	CHECKED	SHANGHAI JWEILL MACHINERY CO., LTD.	
			DESIGNED	APPROVED	SCALE	TITLE
					NO	DRAWING NO.
						ISSUED DATE
						25 April 2005

Trim Winding  
 Main Loop (2)  
 48





电源指示  
Power Indication

收卷1启停  
Winder 1 Start/Stop

收卷2启停  
Winder 2 Start/Stop

收卷风机启停  
Winder Fan Start/Stop

收边1启停  
Winding 1 Motor Start/Stop

收边2启停  
Winding 2 Motor Start/Stop

收边风机启停  
Winding Fan Start/Stop

remote controle

Rev.	Approved Date	Remarks

DRAWN		CHECKED	
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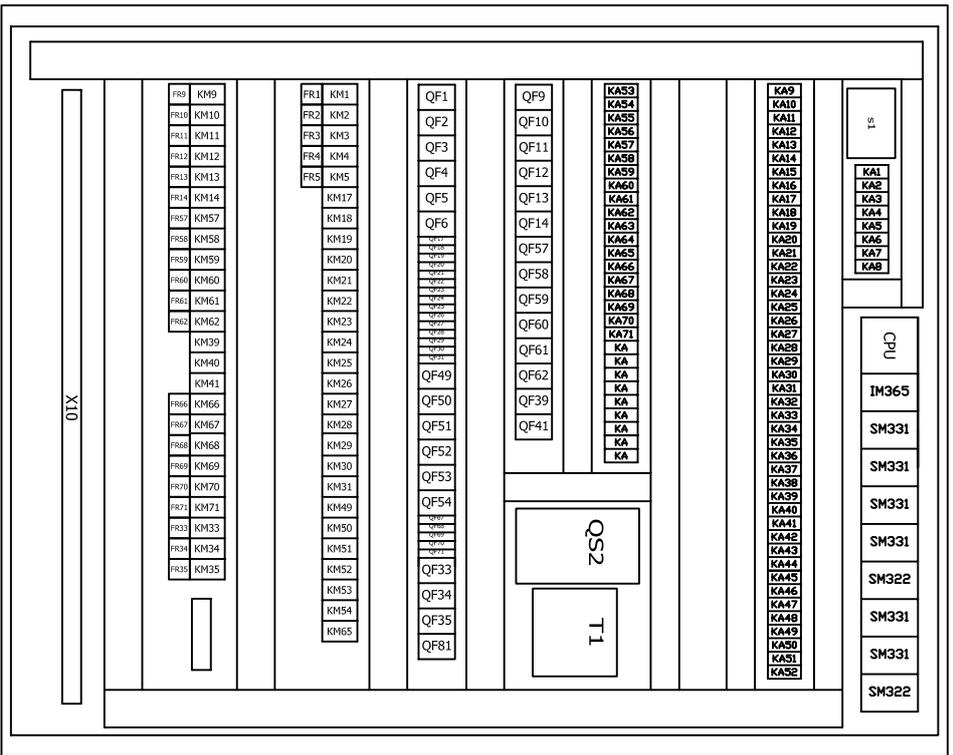
SHANGHAI JIWEI MACHINERY CO., LTD.			
SCALE	TITLE	Winder Control Circuit (I)	
NO	DRAWING NO.	50	
ISSUED DATE	25 April 2005		











Rev.	Approved Date	Remarks

DRAWN	DESIGNED	CHECKED	APPROVED	SHANGHAI JWELL MACHINERY CO., LTD	
				SCALE	TITLE
NO	ISSUED DATE	DRAWING NO.	TEMPERATURE CONTROL CIRCUITRY DISPOSAL PLAN		



## A.6 Instruction manual



## 滁州金纬片板膜智能装备有限公司

CHUZHOU JWELL SHEET&PLATE&FILM INTELLIGENT MACHINERY CO., LTD.

# Extrusion Solution Of SHEET & FILM



### 滁州金纬片板膜智能装备有限公司

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### CHUZHOU JWELL SHEET&PLATE&FILM INTELLIGENT MACHINERY CO., LTD.

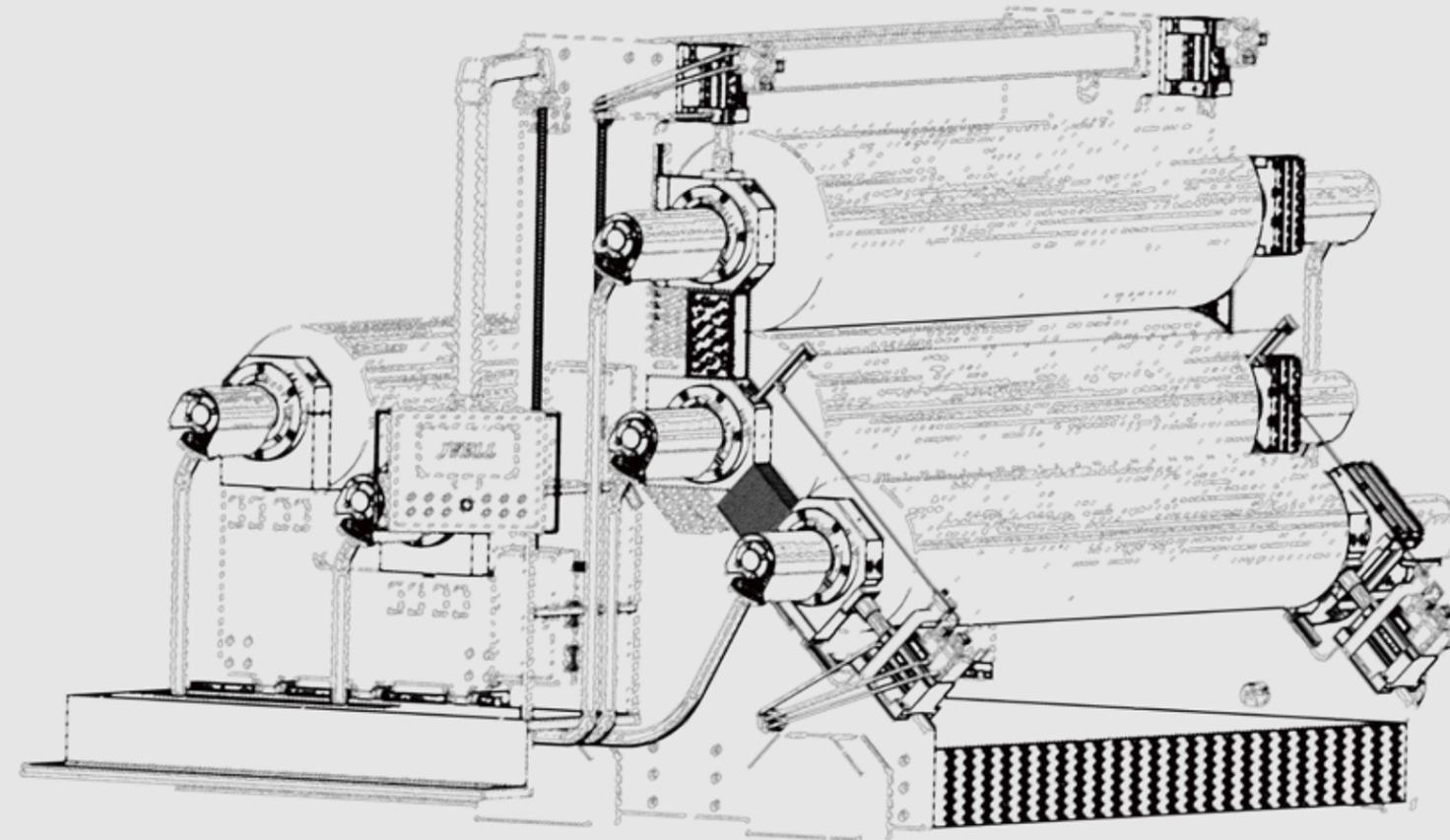
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**滁州金纬片板膜智能装备有限公司简介:**

滁州金纬片板膜智能装备有限公司是上海金纬公司的又一重要发展战略中心,坐落于滁州市国家级经济技术开发区,是一家致力于塑料挤出成型设备的研发、制造的高科技企业。厂区占地面积 235 余亩,公司拥有一支高素质的研发队伍和经验丰富的机械、电气调试工程师团队,以及先进的机械加工基地和规范的装配车间。公司本着“用心持久、拼搏创新”的企业精神,不断探求开拓挤出新领域。热烈欢迎国内外新老客户莅临我司参观、指导、合作,我们愿为您提供强有力的支持。



公司产品已遍布全国各地,并出口到俄罗斯、印度、韩国、印尼、中东、非洲和南美洲、西班牙、意大利等100多个国家和地区,深受客户好评。

**“品质卓越 完美如一”**

是金纬公司的质量方针,是全体员工努力的方向。

**“诚实待人”**

是我们铸就“百年金纬”的核心理念。

董事长: 何海潮 E-mail: he@jwell.cn

CHUZHOU JWELL SHEET&PLATE&FILM INTELLIGENT MACHINERY CO., LTD. is another development strategy center of Shanghai JWELL Machinery Co.,Ltd, locating at Chuzhou National Economic and Technological Development Zone, a high-tech manufacturer specializing in research and development of plastic extrusion equipment. The factory area is of 235 acres; We have a high qualified R&D and experienced mechanical and electrical engineer team as well as advanced processing foundation and normative assembly shop. Our enterprise spirit is "Attentive, Enduring, Quick and Orderly", keeping on exploring of new extrusion field. Mostly welcome to new and old customers to visit us for investigation, guidance and cooperation. We are happy to offer powerful support.



Our customers are all over China, and we have customers in Russia, India, Korea, Indonesia, Middle East, South America, Spain, Italy and other countries. Our machines are well accepted by our customers.

President: He Haichao Mobile /WhatsApp +86 13601628188



## PP/PE二氧化碳超临界发泡生产线 PP, PE Carbon Dioxide Supercritical Foaming Production Line

**PP发泡板**也称聚丙烯发泡板，是以聚丙烯为原料，用二氧化碳气体发泡完成的，可广泛应用于汽车零部件、设备制造、文具、包装、建筑材料等领域。

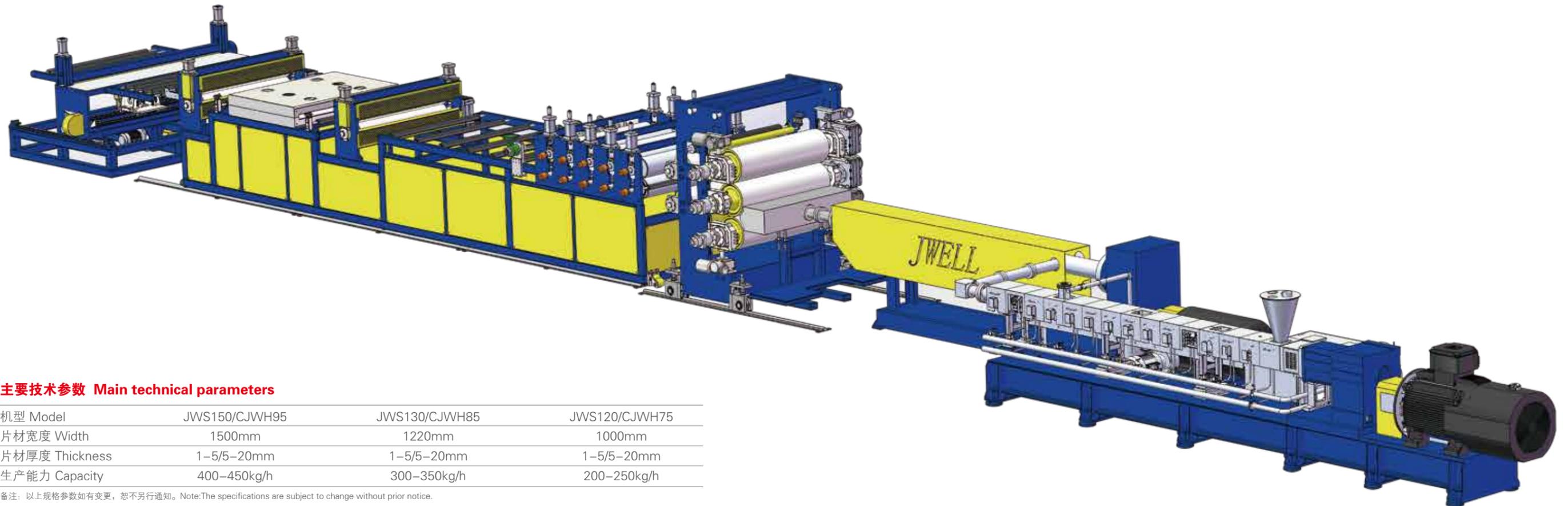
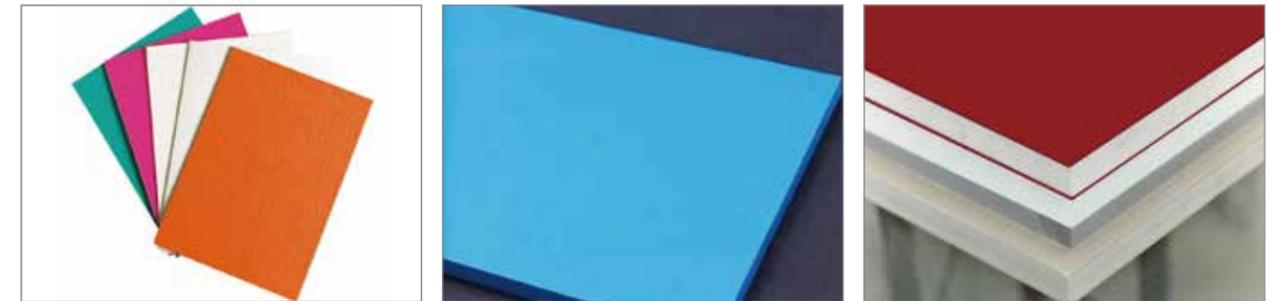
**PP foam board**, also known as polypropylene foam board, is made of polypropylene as raw material and foamed with carbon dioxide gas. It can be widely used in auto parts, equipment manufacturing, stationery, packaging, building materials and other fields.

### 发泡板性能:

1. 优良的耐热性
2. 优良的力学性能
3. 显著的隔热性
4. 良好的回弹性
5. 耐化学腐蚀性
6. 良好的耐应力开裂性能
7. 可回收再生

### PP foam board performance:

1. Excellent heat resistance
2. Excellent mechanical properties
3. Significant thermal insulation
4. Good resilience
5. Chemical resistance
6. Good stress cracking resistance
7. Recyclable and renewable



### 主要技术参数 Main technical parameters

机型 Model	JWS150/CJWH95	JWS130/CJWH85	JWS120/CJWH75
片材宽度 Width	1500mm	1220mm	1000mm
片材厚度 Thickness	1-5/5-20mm	1-5/5-20mm	1-5/5-20mm
生产能力 Capacity	400-450kg/h	300-350kg/h	200-250kg/h

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.

## PP/PS环保片材生产线

### PP, PS Environmental Sheet Extrusion Line

金纬机械研制开发的PP/PS片材生产线，用于生产多层复合环保片材，该片材主要用于吸塑成型各类食品容器和包装，如：托盘、面碗、饭盒、糕盒、水果盘等。该设备可有效的利用石粉比例，既降低片材原料成本，又提高片材的可降解性并保证片材的综合物理性能和后续可加工性能。

Developed by Jwell, this line is for producing multi-layer environmental-friendly sheet, which is widely used for vacuum forming, green food container and package, different kinds of food packaging container, such as: salver, bowl, canteen, fruit dish, etc. Adopting maxim talc percentage in the sheet production, either customer will be able to reduce the cost of the sheet or increase the sheet degraion character as well as gaining good physical properties and further processing abilities.



#### 主要技术参数 Main technical parameters

机型 Model	JWS150/120/90-1800	JWS150/60-1200	JWS130/60-1000	JWS120-1000	JWS100-800
片材宽度 Width	1500mm	1000mm	900mm	800mm	600mm
片材厚度 Thickness	0.3-2mm	0.3-2mm	0.3-2mm	0.2-2mm	0.1-0.8mm
生产能力 Capacity	1000-1200kg/h	700-800kg/h	550-600kg/h	400-500kg/h	300-350kg/h

备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.

## 双螺杆免干燥排气型PET/PLA片材生产线 Twin Screw Dyer-free Vented PET, PLA Sheet Extrusion Line

金纬机械推出的双螺杆免干燥排气型PET/PLA片材生产线具有低能耗、工艺简单，设备使用维护方便的特点。其特有的螺杆组合结构有效的减少了PET/PLA树脂的粘度降，对称式薄壁型辊筒提高了冷却效率同时提升了产能和片材品质，多组分喂料装置可合理的控制新料、回料、色母等的比例，所生产的片材可用于吸塑印刷包装等领域。

JWELL develops the parallel twin screw extrusion line for PET,PLA sheet, this line equipped with degassing system, and no need drying and crystallizing unit. The extrusion line has the properties of low energy consumption, simple production process and easy maintenance. The segmented screw structure can reduce the viscosity loss of PET,PLA resin, the symmetrical and thin-wall calender roller heighten the cooling effect and improve the capacity and sheet quality. Multi components dosing feeder can control the percentage of virgin material, recycling material and master batch precisely, the sheet is widely used for thermoforming packaging industry.



### 主要技术参数 Main technical parameters

机型 Model	共挤线 Multi layer	单层线 Single layer	高效 Highly-efficient
挤出机规格 Extruder specification	JW75&36/40-1000	JW75/40-1000	JW95&52/44-1500
制品厚度 Thickness of the product	0.15-1.5mm	0.15-1.5mm	0.15-1.5mm
主电机功率 Main motor power	110kw/45kw	110kw	250kw/55kw
最大挤出产量 Max extrusion capacity	500kg/h	450kg/h	800-1000kg/h

备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.

## APET/PETG/CPET/PLA单螺杆片材生产线 APET, PETG, CPET, PLA Sheet Extrusion Line

### APET、PETG、CPET、PLA单层及多层共挤片材生产线

是目前国内技术先进、工艺成熟、设备稳定的片材生产线之一，与国内同类设备相比，综合效能高30%以上，此生产线同时也可用于生产PS、PP、PE等片材制品。

### APET, PETG, CPET, PLA single-layer or multi-layer sheet extrusion machine

It's one of the most advanced production lines with matured technology and stability in China. Compared with other same kind equipment, it's over 30% higher in overall efficiency. Line is suitable for PS, PP, PE as well.

### 主要技术参数 Main technical parameters

机型 Model	共挤线 Multi layer	单层线 Single layer	高效 Highly-efficient
挤出机规格 Extruder specification	JW120/65-1000	JW120-1000	JW120-1500
制品厚度 Thickness of the product	0.20-1.5mm	0.15-1.5mm	0.15-1.5mm
主电机功率 Main motor power	110kw/45kw	110kw	160kw
最大挤出产量 Max extrusion capacity	500kg/h	450kg/h	800kg/h

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.



### PETG片材 PETG sheet

PETG俗称低温PET，产品具有高光泽、高透明、有优良的阻隔性、自粘性的新型环保包装材料。可用于胶水粘合、高周波加工。PETG is called low temperature PET, it's a new environment-friendly packing material with features such as high luster, good transparency, excellent barrier property, self-adhesion, which is used for glue bonding and high-frequency processing.

### CPET片材 CPET sheet

CPET是一种改性PET，具有耐高温的特性，通常用于微波炉烤盘等。

CPET is a kind of modified PET. With good resistance to high temperature, it is usually used for package in microwave oven.

### PET立体光栅片 PET stereoscopic optical grating sheet

广泛适用于化妆品、药品、烟酒包装及一般商品等三维防伪外包装以及文具、挂件、宣传广告、海报、各式卡片、吊卡等领域。It can be used as top grade package for cosmetics, medicine, tobacco & alcohol and common goods such as stationery, advertisements, posters and all kinds of cards.

### PLA片材 PLA sheet

聚乳酸PLA是可降解树脂，可用于水果、蔬菜、鸡蛋、熟食和烘烤食品的硬包装，也可用于三明治、饼干和鲜花等商品的包装。PLA is a kind of line shape Aliphatic Polyesters. PLA can be used in rigid package of fruits, vegetables, eggs, cooked food and roast food, also can be used for packaging of sandwich, biscuit and some other packages like fresh flower.

## PP/EVA/EVOH/PS/PE多层共挤阻隔片材生产线 PP, EVA, EVOH, PS and PE Multi-Layer Sheet Co-Extrusion Line

### PP、EVA、EVOH、PS、PE多层共挤阻隔片材生产线

由于市场对产品越来越苛刻的要求，金纬开发了先进的五层对称和七层非对称分配技术，使该设备生产出的产品获得了更优异的阻隔性能。

### PP, EVA, EVOH, PS and PE multi-layer sheet co-extrusion line

To meet market's high request on products, JWELL develops advanced technology of five layer symmetrical distribution and seven layer asymmetrical distribution, which makes the sheets having better barrier performance.

### PP/EVA/EVOH/EVA/PP五层或七层共挤复合高阻隔保鲜包装片材

是具有良好的阻气性、阻湿性，是气体阻隔性能良好的一种塑料包装材料。主要应用于果冻包装，高档肉食品、快餐米饭等食品包装，药品、化妆品等包装。

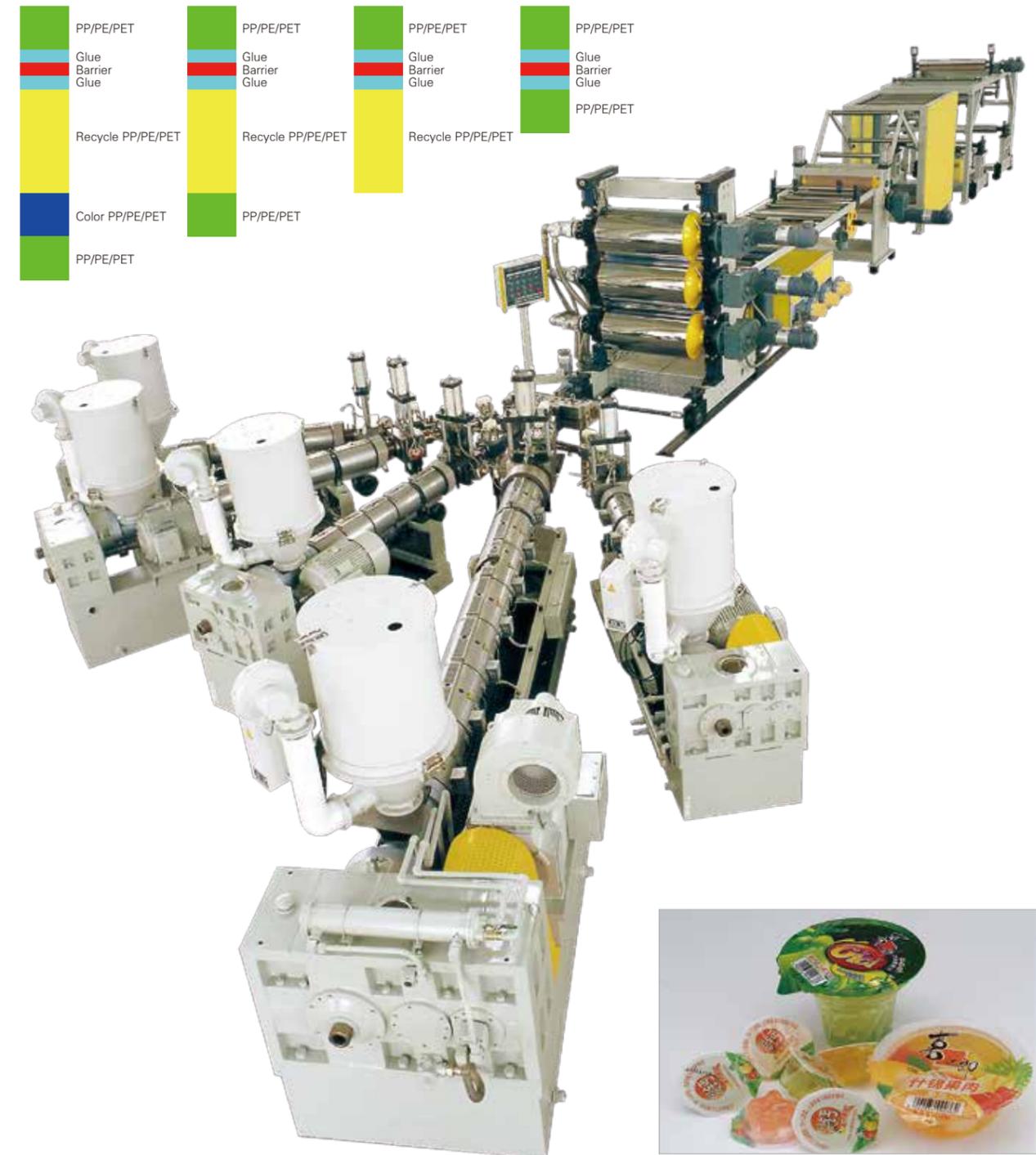
### PP/EVA/EVOH/EVA/PP five or seven multi-layer co-extrusion high barrier fresh keeping sheet

has the excellent anti-oxygen and anti-humidity features. It is one of the best barrier packing materials. Mainly used for Jelly packing, meat packing, snack food packing, medicine and cosmetic packing and so on.

### 主要技术参数 Main Technical Parameters

机型 Model	JW100/45/45-1000	JW120/45/30/65-1200	JW150/45/45-1500
适用原料 Suitable material	PP、PE、PET、PS		
片材宽度 Width	800mm	1000mm	1200mm
片材厚度 Thickness	0.5-2mm	0.5-2mm	0.5-2mm
生产能力 Capacity	300kg/h	400kg/h	650kg/h
设计线速度 Designed line speed	15m/min	20m/min	30m/min
辊筒直径 Calendar diameter	Ø400mm	Ø500mm	Ø600mm

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.



## PVC透明片/装饰片材生产线 PVC Transparent Sheet, Decorative Sheet Production Line

PVC硬质片材分为两种：透明硬质片材和不透明硬质片材两种：

PVC透明硬片：药品/礼品/文具包装，LED扩散板；

PVC木塑板材：装饰板，门板，广泛应用于建筑装饰行业；

PVC仿大理石板材：

a、板材表面覆仿大理石纹装饰膜，或者热转印仿大理石纹并UV固化处理，良好的抗划伤性，耐刮擦性；

b、板材花色、品种多样，施工方便；

c、在室内墙体装潢中替代大理石等天然石材，良好的耐老化性、抗紫外线、耐黄变，绿色环保、无辐射。

PVC rigid sheets are divided into two types:transparent sheet and non-transparent sheet:

PVC Transparent Rigid Sheet:Medicine/Gift/Stationery packaging, LED diffuser plate;

PVC Wood-Plastic plate:Decorative panels, door panels, widely used in the building decoration industry;

PVC Imitation Marble Board:

a.The surface of the board is covered with imitation marble pattern, or heat transfer imitation marble pattern and UV curing treatment, good scratch resistance.

b.Board with variety of color,it's convenient to construct.

c.Replace the natural stone such as marble in the interior wall decoration, good ageing resistance, UV resistance, yellowing resistance, green environmental protection, no radiation.



### 主要技术参数 Parameters of extrusion line

种类 Species	透明片材 Transparent Sheet	木塑板材 Wood-Plastic Board	UV仿大理石 Imitation Marble Board	PVC装饰板 PVC Decoration sheet
型号 Model	SJZ80/156	JSJZ80/156	SJZ80/156	SJZ92/188
适用原料 Material	PVC	PVC	PVC	PVC
制品宽度 Products Width	1220mm	1220mm	1220mm	2000mm
制品厚度 Products Thickness	0.5-3mm	1.5-3mm	4-5mm	1.5mm
产量 Output	400kg/h	450kg/h	600kg/h	600-700kg/h

备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.



## PP+淀粉改性降解片材生产线

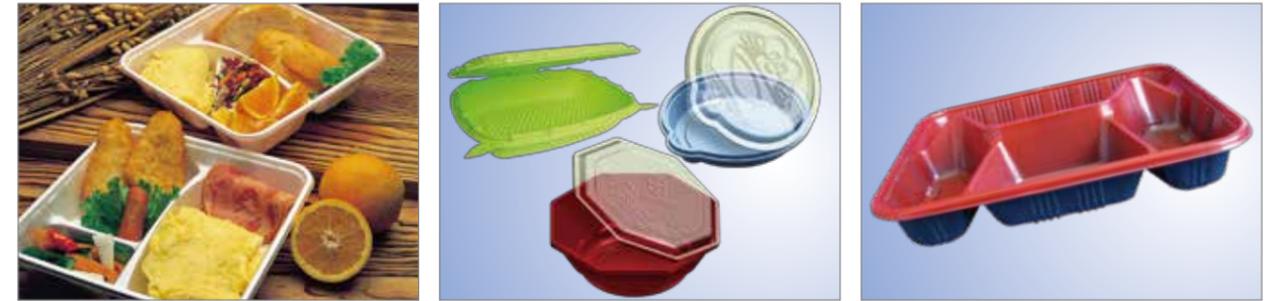
### PP+ starch Modified Degradation Sheet Production Line

#### PP+淀粉改性降解片材生产线

金纬机械研制开发的PP+淀粉改性降解片材生产线，采用三台挤出机三层或四层共挤法，选用金纬新设计的PP+淀粉专用排气式螺杆结构，PLC电脑控制和自动测厚仪跟踪检测，从而有效利用淀粉比例，在降低片材原料成本的基础上，又确保片材的综合物理性能和后续可加工性能，使生产线产能指数达到良好状态，是目前国内先进的片材机组之一。

#### PP+ starch modified degradation sheet production line

It developed by Jwell company uses the three extruders for 3 or 4 layers co-extrusion. This line adopts the Jwell latest designed PP+starch vented screw and the PLC computer controlling device and automatic thickness detection device so that the machine can maximize the percentage of the starch in the sheet production to reduce the cost of the sheet and the sheet produced can gain the good physical properties and further processing abilities. It is the most advanced sheet machine in China.



#### 主要技术参数 Main technical parameters

机型 Model	JW-120/100/45-1500
分层形式 Layer structure	A/B/C/A
制品宽度 Products width	1320mm
制品厚度 Products thickness	0.3-1mm
最大挤出产量 Designed capacity	800kg/h

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.

## PC/PMMA/GPPS光学片材生产线 PC, PMMA, GPPS Optical Sheet Production Line

### PC、PMMA、GPPS光学片材生产线

为了满足市场的需要，金纬机械凭借先进的工艺技术及装备向用户提供了光学级片材生产线。根据原料的流变性设计的专用螺杆和精密的计量泵系统和模具保证了熔体的均匀稳定和片材优异的光学性能；精密的压光系统给片材的机械物理性能提供了保障。

### PC, PMMA, GPPS Plastic Sheet & Plate Extrusion Line

To meet the demands of market, JWELL supply customer PC PMMA optical sheet extrusion lines with advanced technology, the screws are specially designed according to the rheological property of raw material, precise melt pump system and T-die, which makes the extrusion melt is even and stable and the sheet has excellent optical performance. Precise calender system guarantees the mechanical & physical properties of sheets.



### 主要技术参数 Main technical parameters

型号 Model	JW130/38-2200	JW120/38-1400
适用原料 Material	PC、PMMA、GPPS	PC、PMMA、GPPS
制品宽度 Products Width	2200mm	1400mm
制品厚度 Products Thickness	1.5-10mm	1.5-10mm
挤出机规格 Extruder Specification	Ø130/38; Ø45/30	Ø120/38
最大挤出产量 Capacity (Max.)	550kg/h	450kg/h

备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.



## ABS/HIPS/PMMA冰箱板/洁具板材生产线 ABS, HIPS, PMMA Refrigerator Plate, Sanitaryware Plate Extrusion Line

### ABS、HIPS、PMMA冰箱板、洁具板生产线

金纬提供国内领先的大产量低能耗板材挤出生产线，具备集中供料系统及机械手自动堆垛装置，实现了高程度的自动化生产功能，大大的降低生产成本并提高了产品品质。该生产线深受广大客户的欢迎。

### ABS, HIPS, PMMA refrigerator plate, sanitaryware plate extrusion line

JWELL provides the leading plate extrusion lines with large output and low energy consumption, the lines are equipped with concentrated material feeding system and automatic piler, its automatic production function reduce the cost of processing and improve product quality highly. This extrusion line is popular in our customers.

### 冰箱板 Refrigerator board

主要用于冰箱冰柜门胆、内胆、抽屉、接水盘、饮水机等。

It has wide application in production of refrigerator door and inner gallbladder, drawers, water dispensers, etc.

### 洁具板 Sanitaryware plate

用于卫浴产品如：浴缸、淋浴房、蒸汽房、洗脸槽。

It is widely applied in the field of bath products, such as the bathtub, the shower cabinet, the vapor room, washing bowl, etc.

### 广告板 Advertising board

主要应用于：指示导向牌、胸标牌、机械标牌、广告装潢、室内装饰等。

This board is mainly used in guiding board, machinery sign, advertisement decoration, indoor decoration and so on.

### 箱包板 Baggage plate

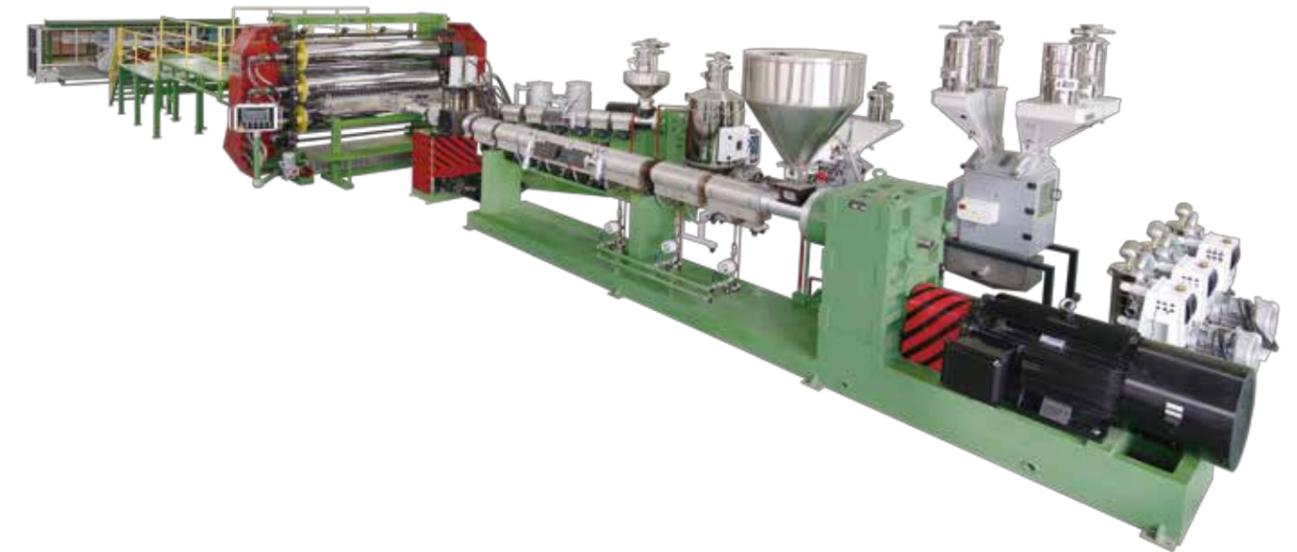
主要用于各种拉杆箱、行李箱、休闲包等箱包。

It is mainly applied in field of draw-bar boxes, luggage cases, recreation bags, etc.

### 汽车板 Car plate

主要用途：汽车车顶、仪表板；座椅靠板、车门板、窗框；摩托车、沙滩车、代步车、高尔夫球车等外壳。

It is mainly used for producing tops of cars and buses, instrument boards, backrest, car doors, window frames, shells of the motorcycles, golf vehicles, etc.



### 主要技术参数 Main technical specification

机型 Model	JW160/60-2200	JW130/60-2000	JW120/60/45-1900	JW130/70/60-2700
适用原料 Suitable material	ABS、HIPS	ABS、HIPS	ABS、HIPS	ABS、PMMA
挤出机规格 Extruder model	JWS160/38,60/35	JWS130/38、60/35	JWS120/38,60/35,45/35	JWS130/38,70/35,60/35
共挤分层形式 Feed form	A/B,A/B/A	A/B,A/B/A	A/B/C	A/B/C/B/A
制品宽度 Products width	2000mm	1800mm	1700mm	2100-2500mm
制品厚度 Products thickness	1-6mm	1-6mm	1-6mm	2-8mm
最大挤出产量 Designed capacity	1500kg/h	1200kg/h	550kg/h	700kg/h

备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.

## PP/PE/ABS厚板生产线 PP, PE, ABS Thick Plate Extrusion Line

### PP厚板生产线 PP thick plate extrusion line

PP厚板，可广泛用于化学工业、食品行业、防腐行业、净化行业、环保设备生产行业。

2000mm宽PP厚板生产线是金纬新开发的领先于同行的最稳定的生产线。

PP thick plate, is an environmentally-friendly product and is widely applied in chemistry industry, food industry, anti-erosion industry, environmentally-friendly equipments industry, etc.

PP thick plate extrusion line of 2000mm width is a newly developed line which is the most advanced and stable line compared with other competitors.

### PE厚板生产线 PE thick plate extrusion line

聚乙烯（PE）板材广泛应用于化工、电力等工业上。HDPE板还可作为工程塑料应用在机械、化工等设备上，广泛用于制造冰球场墙板。

PE plate is widely applied in chemical and electric power industries. HDPE plate, known as engineering plastics, is used in mechanical and chemical equipments as well as ice hockey ring walls.

### ABS厚板生产线 ABS thick plate extrusion line

ABS厚板广泛应用于家电、电子、包装、医疗器械等领域。

ABS thick plate is widely used in the home appliance, electronics, packaging, medical appliance.



### 主要技术参数 Main technical specification

机型 Model	JW120-1600	JW150-2100	JW170-2600	SJZ80/156-1500
适用原料 Suitable material	PP、PE、ABS、PVDF	PP、PE、ABS	PP、PE、ABS	PVC
制品宽度 Products width	1220mm	1500mm	2000mm	1220mm
制品厚度 Products thickness	3-30mm	3-30mm	3-30mm	3-30mm
设计挤出产量 Designed capacity	350kg/h	500kg/h	700kg/h	400kg/h

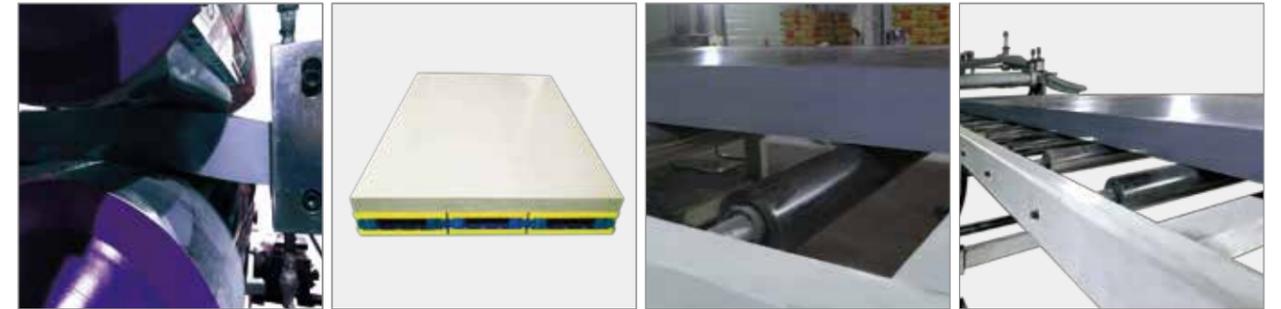
备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.



## PVC厚板生产线 PVC Thick Plate Extrusion Line

**PVC厚板特点及用途:** PVC厚板表面光洁, 平整, 不吸水, 不变形, 易于加工等优点, 是优等的热成型材料, 能替代部分不锈钢和其它耐腐蚀合成材料, 被广泛用于化工, 石油, 电镀, 水净化处理设备, 环保设备等行业。

**PVC thick plate features and uses:** PVC thick plate surface is smooth, flat, non-absorbent, non-deformable, easy to process, etc. It is an excellent thermoforming material that can replace some stainless steel and other corrosion-resistant synthetic materials and is widely used in chemical industry. Oil, electroplating, water purification equipment, environmental protection equipment and other industries.



### 主要技术参数 Main technical parameters

型号 Model	SJZ80/156
适用原料 Material	PVC
制品宽度 Products Width	1220mm
制品厚度 Products Thickness	5-100mm
产量 Output	450kg/h

备注: 以上规格参数如有变更, 恕不另行通知。Note: The specifications are subject to change without prior notice.

## PC耐力板/波浪板生产线

### PC Sheet Extrusion Line, Corrugated Sheet Extrusion Line

#### PC耐力板

适用范围：园林、游艺场所奇异装饰及休息场所的廊亭；商业建筑的内外装饰品，现代城市楼房的幕墙；航空透明集装箱、摩托车前风挡、飞机、火车、轮船、汽车、汽船、潜艇及玻璃军警盾牌；电话亭、广告路牌、灯箱广告展示展览的布置；高速公路及城市高架路隔音屏障。

#### Applicable scope of PC endurance board

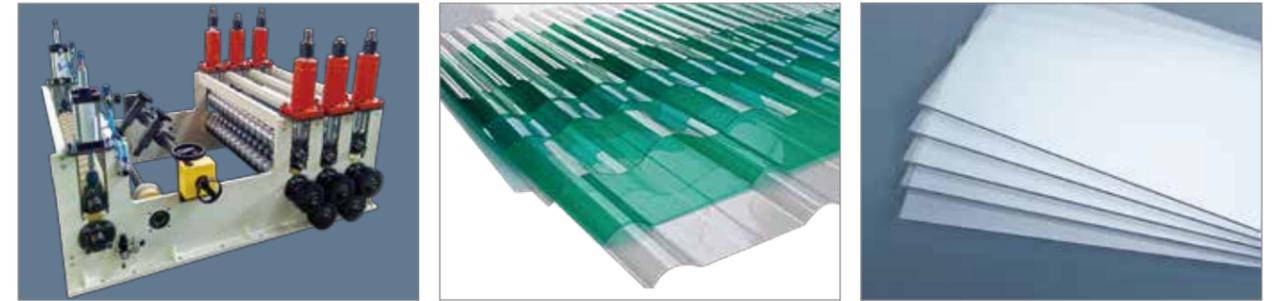
Garden, the recreation place, decoration and the corridor pavilion; Internal and external ornaments in the commercial building, curtain wall of the modern urban building; transparent container of aviation, the windscreen before the motorcycle, the plane, the train, the steamer, the submarine, army and police's shield, the telephone booth, advertising signpost, the advertisement of the lamp houses, the expressway and overhead way of the city partition protective screen.

#### PC波浪板

PC波浪板以其优良的耐候性、抗冲击性。及高透光性等优良性能，广泛应用于仓库屋顶和简易建筑构造物的顶棚，如：运动馆、游泳池、滑雪场等内场通道、车站休息亭等等，具有广阔的市场前景。

#### PC corrugated sheet

PC corrugated board has the merits of good weather resisting property, impact resistance, high light transmission. It is widely used in the roof for warehouses and easy constructions, such as stamming pools, skiing fields, station rest pavilions and so on.

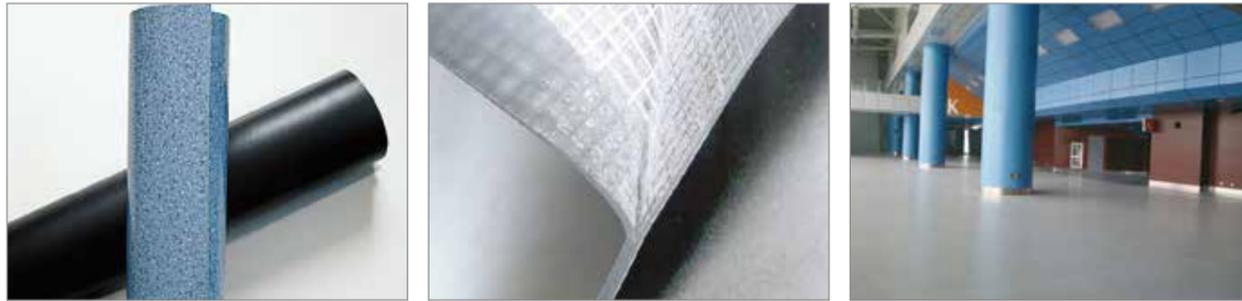


#### 主要技术参数 Main technical parameters

型号 Model	JW-130/38-2200	JW120/38-1400
适用原料 Material	PC	PC
制品宽度 Products Width	2100mm	1300mm
制品厚度 Products Thickness	2-10mm	1.5-10mm
挤出机规格 Extruder Specification	130/38; 45/30	120/38
最大挤出产量 Capacity (Max.)	550kg/h	450kg/h

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.

## PVC地板革生产线 PVC Floor Leather Extrusion Line



主要用于生产PVC地板革类产品。PVC地板革具有耐磨、耐腐、防滑、防渗、阻燃的性能，广泛用于机车、宾馆、酒店、娱乐厅、展馆、家庭。

可以根据客户的要求，配置不同的设备组件，用于生产单层、多层复合产品；也可增加放卷装置，生产内增强产品或表面复合无纺布、PVC装饰膜等的产品。

Mainly used for producing the sort of PVC Floor leather rolls. PVC Floor leather has the performance of anti-friction, corrosion resistance, skidproof, impermeable and inflaming retarding, and is widely used on auto, hotel, amusement place, exhibition hall, house, etc.

The structure of this production line is simple, and convenient to operation. According to customers' requirement, equipped with different components, used for producing single layer, multi-layer composite production and also can be equipped with unreeling unit, used for producing inner strengthen production or surface compound non-woven fabrics and PVC decoration film, etc.



### 主要技术参数 Main technical parameters

型号 Type	双层 Double layers	三层 Three layers
制品宽度 Products width	1500-2000mm	2000-3000mm
挤出机规格 Extruder specification	SJZ65/132 - SJZ80/156	SJZ65/132 - SJZ80/156 - SJZ65/132
最大挤出量 Max output capacity	500-550kg/h	600-750kg/h
主电机功率 Main motor power	37kw/55kw	37kw/55kw/37kw

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.

## 高速铝塑复合板 High Speed Aluminum Plastic Composite Panel Extrusion Line



铝塑复合板简称铝塑板是由经过表面处理并涂装（用氟碳涂层或聚酯涂层）的铝箔作为表层、聚乙烯材料作为芯层，并通过热复合工艺生产而成的新型装饰材料；主要应用于建筑幕墙、外墙装饰与广告、室内装饰等。

结合传统的生产工艺和实践经验，开发的高速铝塑板生产线，采用先进的挤出系统，可以生产高填充的阻燃级铝塑板，最高产量1800kg/h，最高生产线速度10m/min，可生产宽度900-1560mm，铝箔厚度0.18mm以上的产品。

同时本司也提供传统的铝塑板生产线，最高产量500-800kg/h，最高线速度5m/min，可以生产宽度900-1560mm，铝箔厚度0.06-0.5mm的制品。

Aluminum plastic composite panel called ACP in short, composed by aluminum foil and polyethylene, adopting thermo coating technology to produce this new construction material. It is widely used for construction wall, outer door decoration as well as advertising and inner door decoration.

Combining traditional processing technology and practical experience, Suzhou JWELL machinery Co.,ltd develops high speed flame retardant grade ACP board. the maximun output can be 1800kg/h, line speed is 10m/min, width is 900-1560mm, aluminum foil thickness is more than 0.18mm.

Also, we are supplying normal ACP line with output range 500-800kg/h, maxim line speed 5m/min, suitable product width 900-1560mm, aluminum foil thickness 0.06-0.5mm.



### 主要技术参数 Main technical parameters

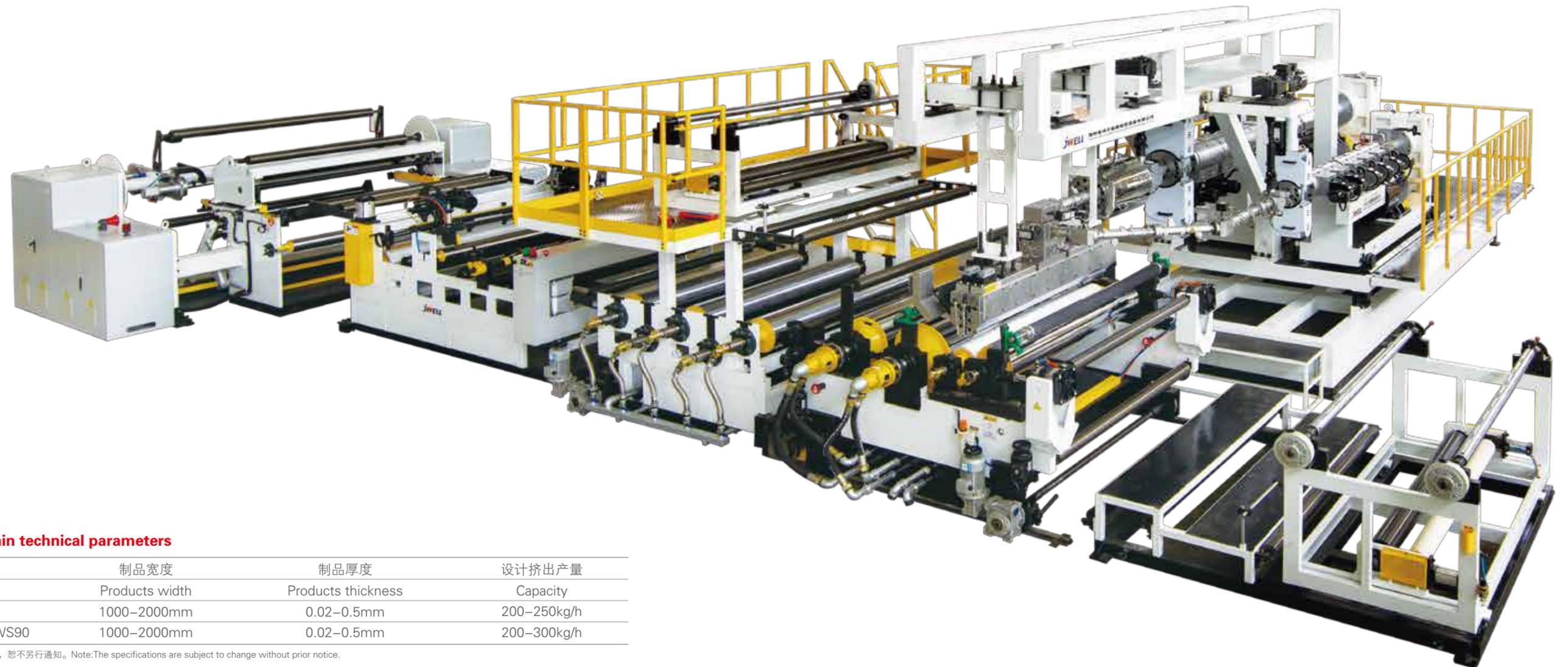
主机型号 Model	产量 Products width	制品宽度 Products width	制品厚度 Products thickness
JWE135/48 (Twin screw extruder)	2000-2500kg/h	900-2000mm	2-6mm
JWS170/35 (Singe screw extruder)	500-600kg/h	900-1220mm	1-6mm
JWS180/35 (Singe screw extruder)	700-800kg/h	900-1560mm	1-6mm

备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.

## TPU高低温薄膜/高弹膜生产线 TPU High-low Temperature, High-elastic Film Co-extrusion Line

**生产线特点:** 通过2台或3台挤出机共挤的方式, 将不同温度范围和硬度范围的TPU原料, 一次性复合挤出成型。相比传统复合工艺, 将高温、低温薄膜下线再复合, 显得更经济、更环保、更高效。制品广泛应用于止水条、鞋材、服装、箱包、文具、体育用品等等。

**Features:** TPU raw materials with different temperature and hardness ranges are extruded by two or three extruders at one time. Compared with the traditional composite process, it is more economical, more environmentally friendly and more efficient to combine high-temperature and low-temperature thin films offline. Products are widely used in water-proof strips, shoes, clothing, bags, stationery, sports goods and so on.



### 主要技术参数 Main technical parameters

机型 Model	制品宽度 Products width	制品厚度 Products thickness	设计挤出产量 Capacity
JWS90+JWS100	1000-2000mm	0.02-0.5mm	200-250kg/h
JWS90+JWS90+JWS90	1000-2000mm	0.02-0.5mm	200-300kg/h

备注: 以上规格参数如有变更, 恕不另行通知。Note: The specifications are subject to change without prior notice.

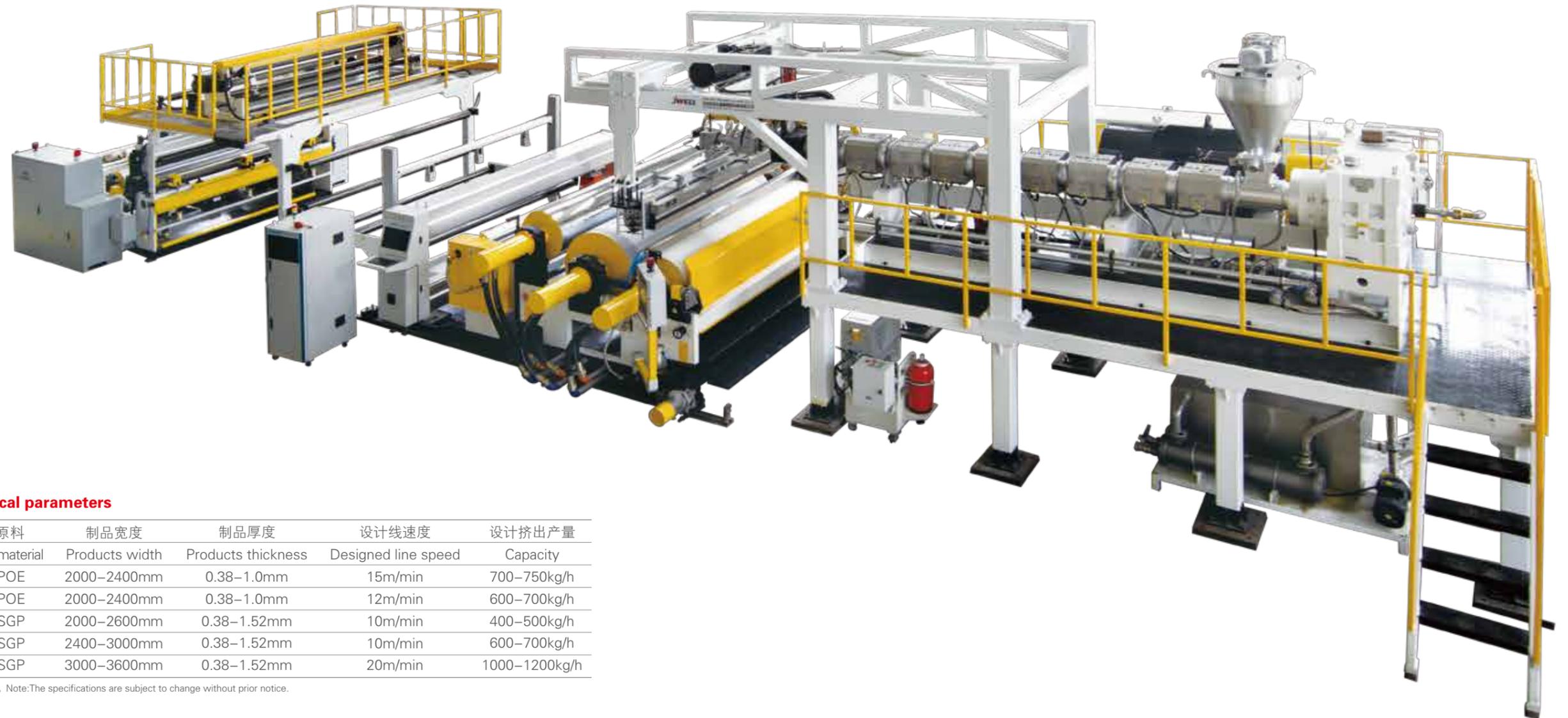
## EVA/POE/PVB/SGP胶膜生产线 EVA, POE, PVB, SGP Film Extrusion Line

**EVA/POE 胶膜:** 用于太阳能光伏电站、建筑物玻璃幕墙、汽车玻璃、功能性棚膜、包装膜、热熔胶等各种行业。

**EVA/POE film** is used in solar photovoltaic power station, building glass curtain wall, automobile glass, functional shed film, packaging film, hot melt adhesive and other industries.

**PVB/SGP胶膜:** 广泛应用于建筑夹层玻璃，汽车夹层玻璃，防弹玻璃，隔音玻璃等。具有很好的安全性，防止玻璃由于外力作用下破碎而碎片溅起伤人；具有隔音性，防紫外线，可以做成彩色或高透明的薄膜。

**PVB/SGP film** is widely used in building sandwich glass, car sandwich glass, bulletproof glass, soundproof glass etc. With good safety function and prevent glass from breaking due to the effect of external force and shards spatter injury; With sound insulation, anti-ultraviolet function, can be made of color or high transparent film.



### 主要技术参数 Main technical parameters

机型	适用原料	制品宽度	制品厚度	设计线速度	设计挤出产量
Model	Suitable material	Products width	Products thickness	Designed line speed	Capacity
JWS120/150/120-2400	EVA/POE	2000-2400mm	0.38-1.0mm	15m/min	700-750kg/h
JWS180-2400	EVA/POE	2000-2400mm	0.38-1.0mm	12m/min	600-700kg/h
JWS150	PVB/SGP	2000-2600mm	0.38-1.52mm	10m/min	400-500kg/h
JWE95-JWE65	PVB/SGP	2400-3000mm	0.38-1.52mm	10m/min	600-700kg/h
JWE135-JWE95	PVB/SGP	3000-3600mm	0.38-1.52mm	20m/min	1000-1200kg/h

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.

## 土工膜/防水卷材生产线 PE Extra-width Geomembrane, Waterproof Roll Extrusion Line

**产品适用:** 工业与民用建筑的屋面防水, 包括种植屋面、平屋面、坡屋面、建筑物地下防水: 包括水库、堤坝、水池防水、隧道、粮库、人防工程、垃圾掩埋场、人工湖防水等。

**Application:** For waterproofing usage in industrial & civil buildings including the green roof, flat roof and the sloping roof. Underground waterproof: reservoir, dam, pool. waterproof usage in tunnel, grain depot, artificial engineering, landfill, Artificial lake.



### 主要技术参数 Main technical parameters

原料/Material	PE	PE
厚度/Width	0.5-3mm	0.5-3mm
宽度范围/Product width range	1000-4000mm	4000-8500mm

备注: 以上规格参数如有变更, 恕不另行通知。Note: The specifications are subject to change without prior notice.

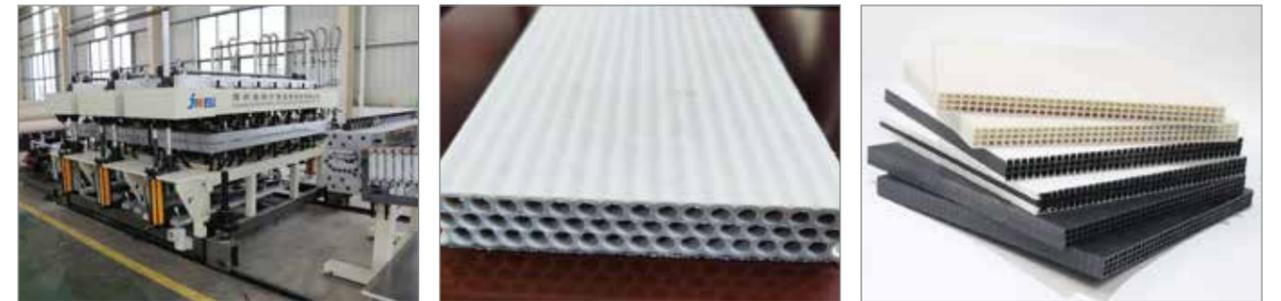
## PP中空建筑模板一模双出生产线 PP Hollow Building Formwork Double Out Extrusion Line

### PP 中空建筑模板一模双出生产线

金纬机械在传统 915mm 单出生产线的基础上,经过不断创新,不断验证后,推出的全新产品,在满足大产量,低能耗的同时,把产品质量的稳定性做到最佳。

### PP hollow building formwork double out extrusion lines

Plate&Sheet Equipment Co.,Ltd produced PP one mold double out building template production line on the basis of the traditional 915mm single production line,that not only could meet the demand of large output and low energy.



### 特点:

1. 三层共挤生产线
2. 三层复合分配器
3. 多层格子模具
4. 三级定型板
5. 组合式牵引机
6. 自动定长切割机

### Characteristics:

1. Three layer coextrusion production line
2. Three layer composite distributor
3. Multi-layer lattice mold
4. Three grade type board
5. Combined tractor
6. Automatic fixed length cutting machine

### 主要技术参数 Parameters of extrusion line

机型 Model	JWS130(80)-1320	JWS150(80)-2000	CJWH85(80/52)-2000
适用原料 Material	PP改性料modified material	PP改性料modified material	PP改性料modified material
制品宽度 Products width	915/1220mm	915mm*2	915mm*2
制品厚度 Products thickness	15-17mm	15-17mm	15-17mm
挤出机规格 Extruder specification	JWS130/35 JWS80/35	JWS150/35 JWS80/35	CJWH85 CJWH52 JWS80
最大挤出量 Capacity (Max.)	450 ~ 500kg/h	550 ~ 600kg/h	600 ~ 700kg/h

备注: 以上规格参数如有变更, 恕不另行通知。Note:The specifications are subject to change without prior notice.

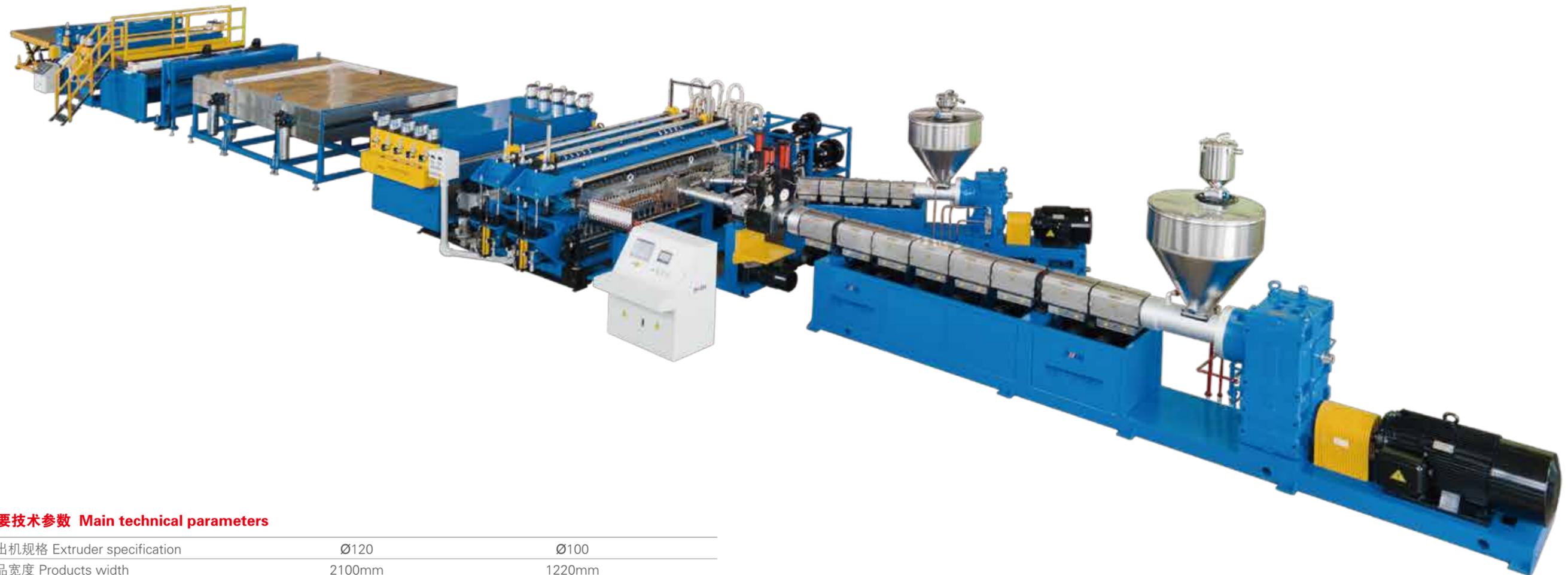
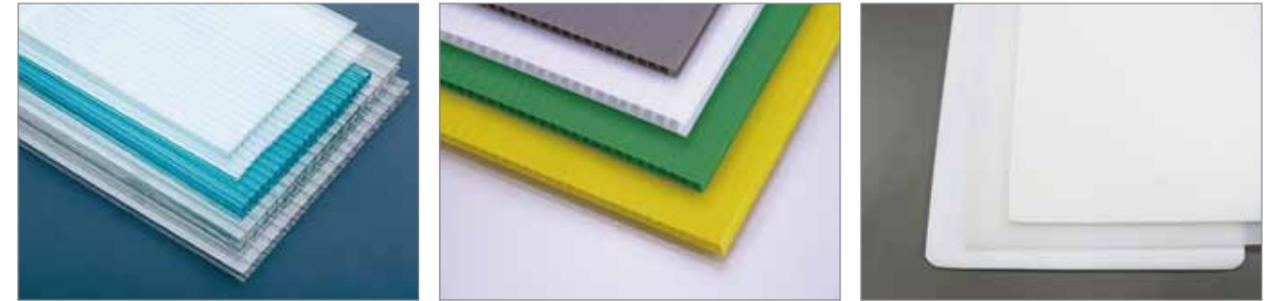
## PP/PE中空格子板生产线 PP, PE Plastic Hollow Cross Section Plate Extrusion Line

### PP格子板应用:

PP中空格子板因具有材质轻,强度高,防潮,良好的环保性能和二次加工性能,可加工成周转箱,包装箱等。

### Application:

The pp hollow cross section plate is light and high strength, moistureproof good environmental protection and refabrication performance.  
Can be processed into the reusable container, packing case, clapboard, backing plate, and culet.



### 主要技术参数 Main technical parameters

挤出机规格 Extruder specification	Ø120	Ø100
制品宽度 Products width	2100mm	1220mm
制品厚度 Products thickness	2-8mm	2-8mm
最大挤出产量 Capacity (Max.)	350kg/h	200kg/h

备注: 以上规格参数如有变更, 恕不另行通知。Note: The specifications are subject to change without prior notice.

## PC中空格子板生产线

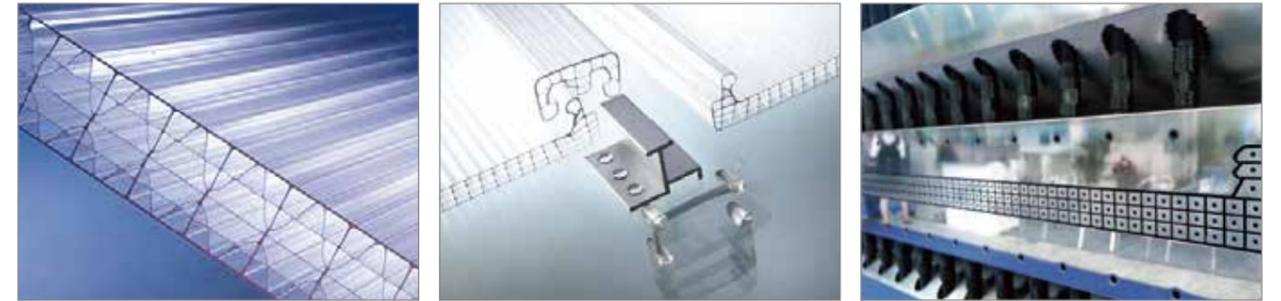
### PC Plastic Hollow Cross Section Plate Extrusion Line

#### PC阳光板应用:

办公楼、大厅、商场、体育场馆、公用设施的采光顶  
 车站、停车场、凉亭、休息厅走廊的雨棚  
 高速公路及城市高架路隔音屏障

#### Application:

Construction of sunroof in buildings, halls, shopping center, stadium, public places of entertainment and public facility.  
 Ring shield of bus stations, garages, pergolas, corridors.  
 Transparent shields for security forces in nursery schools airports, factories.



#### 主要技术参数 Main technical parameters

挤出机规格 Model	制品宽度 Products width	制品厚度 Products thickness	最大挤出产量 Designed capacity
JWS120	1200-2100mm	2-8mm	350kg/h
JWS150	1200-2600mm	2-8mm	500kg/h
JWS100+JWS65	915mm	12-16mm	400kg/h
JWS150+JWS90	2000mm	12-16mm	600kg/h

备注: 以上规格参数如有变更, 恕不另行通知。Note: The specifications are subject to change without prior notice.

## TPO/PVC+PP发泡汽车内饰表皮复合压花生产线 TPO/PVC+PP Foam Auto Interior Skin Compound Embossing Production Line

汽车内饰表皮复合材料应用于中高级汽车仪表板表皮和汽车侧门板，座椅等内饰，该生产线可在线实现复合压花一次成型，具有生产效率高，复合粘结实，花纹更改便利等优点；

Automobile interior skin composite materials are used in the interior of mid-to-high-end automobile instrument panel skins, automobile side door panels, seats and other interiors. This production line can realize online composite embossing and one-time shaping. It has advantages of high production efficiency, firm composite bonding, and convenient pattern modification.



### 主要技术参数 Main technical parameters

机型 Model	FH-1600/1800mm
复合厚度 Products thickness	0.5-0.8mm
制品宽度 Products width	1600-1800mm
最大速度 Max speed	10m/min
主机功率 Main motor power	280kw

备注：以上规格参数如有变更，恕不另行通知。Note: The specifications are subject to change without prior notice.

## PE加炭黑铜塑复合生产线

### PE Carbon Black Copper-plastic Composite Production Line

**复合型导电高分子**是在本身不具备导电性的高分子材料中掺混入大量导电物质，如炭黑、金属粉、箔等，通过分散，表面铜皮复合等方法构成的复合材料。

**Composite conductive polymer** is a composite material made by mixing a large number of conductive materials, such as carbon black, metal powder, foil, etc., into the polymer material which is not conductive itself, and the surface laminated with copper sheet.

与传统导电材料相比较,复合型导电高分子材料具有许多独特的性能。

Compared with traditional conductive materials, composite conductive polymer has many unique properties.

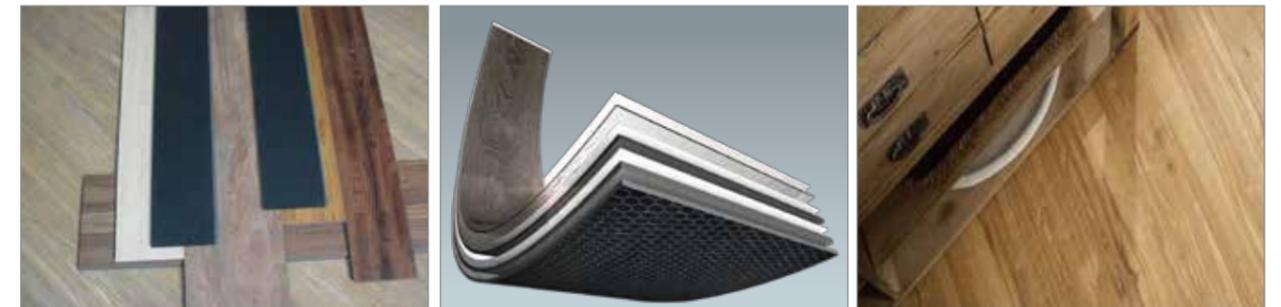


## LVT复合地板生产线

### LVT Composite Floor Production Line

**LVT软质复合地板生产线**由挤出机挤出地板基材，再经过一套六辊复合机对基材与印刷层，耐磨层，防滑层进行同时复合，通过对放卷张力，耐磨层预热的精确控制，达到放卷时不起皱，不收缩，不变形等效果，挤出复合生产效率高，产品质量稳定。

**LVT soft composite floor production line**, production line by extruder extrusion floor base material, then through a set of six roller for base material and printing layer composite machine, wear-resisting layer, layer of compound at the same time, through the rolling tension, wear-resisting layer accurate control of preheating, to put the volume not wrinkle, does not shrink, deformation, extrusion compound high production efficiency, product quality is stable.



#### 主要技术参数 Main technical parameters

机型 Model	SJZ80/156
适用原料 Material	PVC
制品宽度 Products width	1200mm
制品厚度 Products thickness	1.5-4mm
挤出机规格 Extruder specification	SJZ80/156
辊筒规格 Roller specification	Ø400
辊筒数量 No of rolls	6PS
最大挤出量 Capacity (Max.)	500kg/h
主电机功率 Main motor power	75kw

备注：以上规格参数如有变更，恕不另行通知。Note:The specifications are subject to change without prior notice.

## 相关公司产品链接

### Linkage of Relating Auxiliary Equipment



自动换网器和液压站  
Hydraulic Screen Changer



失重式喂料装置  
Dosing System



在线测厚仪  
On-line Continuous Measurements



冷水机  
Water Chiller Unit



挤出机  
Extruder



各类镜面辊筒  
All Kinds of Mirror Rollers



模具和分配器  
T-die And Feedblock



计量泵  
Metering Pump

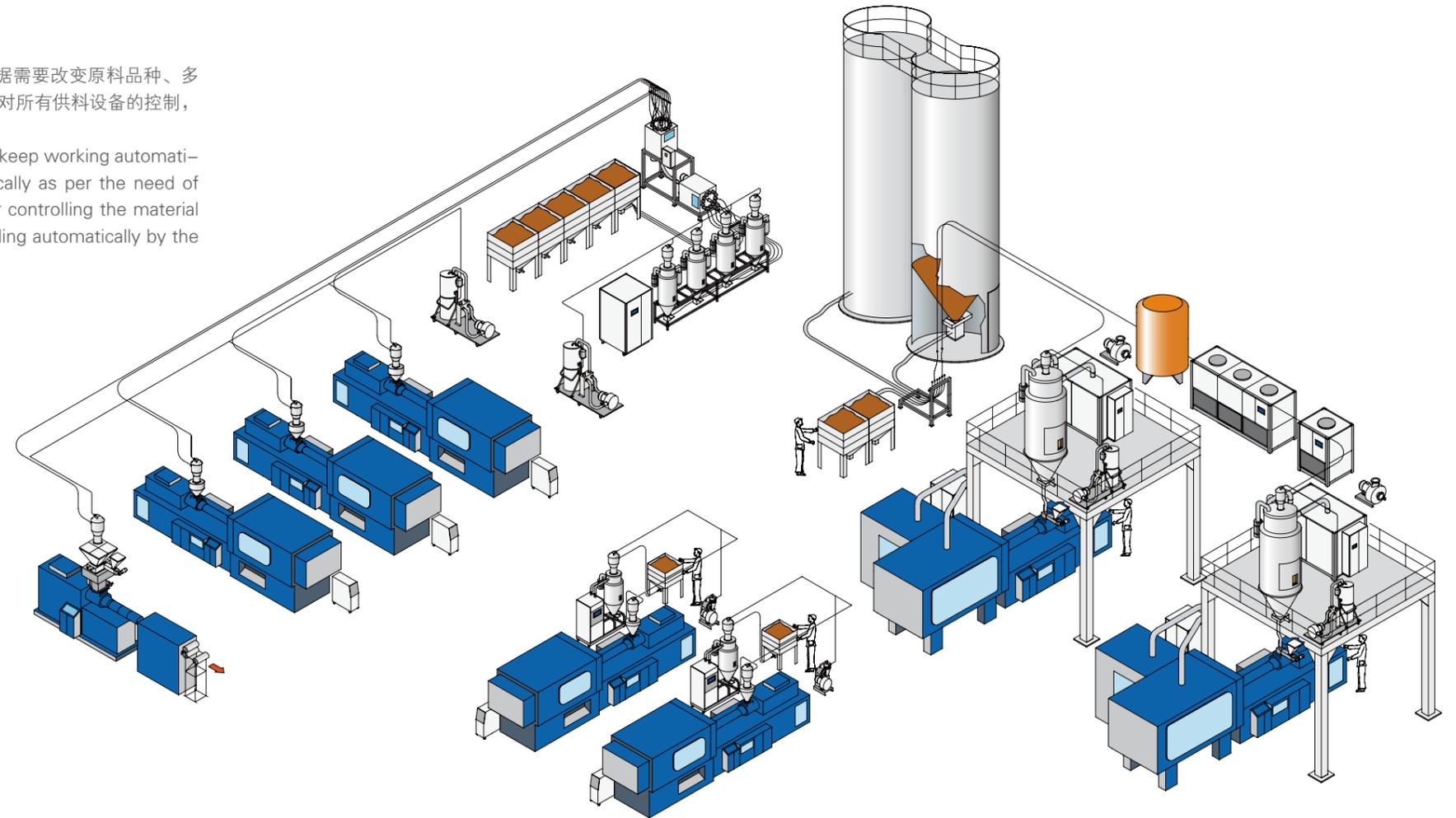


破碎机  
Crusher

## 集中供料系统 Feeding System

集中供料系统是为塑料挤出车间的塑料产品生产而设计的，实现了不间断无人化连续成型作业。可根据需要改变原料品种、多颜色材料的组合使用方式，实现配方工序的自动化。系统能够以全自动方式组合原料成份及状态，能够对所有供料设备的控制，并防止了储料仓内阻塞现象的发生，通过设置中央监控台实现全自动化。

Material centralized feeding system was designed for the plastic product extrusion plant, which can keep working automatically. It can change the raw material and color masterbatch, making up the formulation automatically as per the need of production. The system will make the material components and state automatically, being easy for controlling the material feeding of all production lines, and protecting the material block in the hopper, realizing material feeding automatically by the data setting in the central controlling panel.



**流程:** 原料→储存→计量→干燥→输送→使用

**Process:** material→storage→metering→drying→feeding→use

**特点:** 高效、节能、个性化、现代化工厂形象

**Features:** efficient、energy saving、individuation、image of modern forming factory



计量  
Metering



干燥  
Drying



配管  
Piping



中央气泵  
Central air pump



输送  
Conveying



脉冲集尘器  
Pulse dust collector

## 挤出机械物联网+智能制造解决方案

### Plastic Machinery Fully Integrated Automation + Internet of Things Control System Solutions

工业 4.0 时代的互联 -CPS (信息物理系统 cyber physical systems), 不是简单的对互联网、物联网、传感网的替代, 它是信息世界和物理世界的深度融合。

未来挤出装备不再是一个孤立的自动化、信息化孤岛, 未来的挤出机工厂会通过云平台与整个供需体系形成灵活智能的产品制造网络。工业 4.0 背景下的智能注塑发展趋势, 多品种小批量快周期的定制化生产; 多种生产技术和工艺的高度集成化; 少人或无人状态下的自主生产过程; 从原料到成品整个过程的信息化管理……

The interconnected in the industrial 4.0--CPS (cyber physical systems) is not a simple alternative to the Internet, the Internet of things, and the sensing network. It is a deep integration of the information and the physical.

The future extrusion equipment is no longer an isolated automation and information island. The future extruder factory will form a flexible and intelligent product manufacturing network through the cloud platform and the whole supply and demand system. In the industrial 4.0 background, the development trend of intelligent extrusion, customized production of multi-variety and small batch fast cycle; High integration of various production techniques and processes; autonomous production process under less people or unmanned state; information management from the whole process of raw material to finished product...

在朝着工业 4.0 发展的过程中, 我们的设备更智能化了! 金纬机械智能化生产线:

1. 可以监测主机电流。
2. 可以监测主机温度。
3. 可以监测主机电能。
4. 可以监测主机每吨物料能耗(目前仅支持有米重控制的设备)。
5. 可以在手机上查看数据信息。
6. 可以记录并统计设备故障, 部件更换等信息。
7. 可以连接 MES 系统。
8. 可以远程调试程序。

In the process of industrial 4.0, our equipment is more intelligent! Intelligent production line of Jwell:

1. can monitor the current of the extruder.
2. can monitor the temperature of the extruder.
3. can monitor the power of the extruder.
- 4., the energy consumption per ton of material can be monitored. (At present, only equipment with rice weight control is supported)
5. you can view the data on the phone.
6. records and statistics of equipment failure, parts replacement and other information can be recorded and counted.
7. can connect the MES system.
8. the program can be debugged remotely.



实时工况  
Real-time operating status



作业情况统计  
Working status statistics

基于MES系统平台, 实现车间生产管理的信息沟通平台, 并向智能化方向发展。

Based on the MES system platform, the information communication platform of workshop production management is realized and move toward the intelligent direction



