

VELZENER

Maschinen GmbH



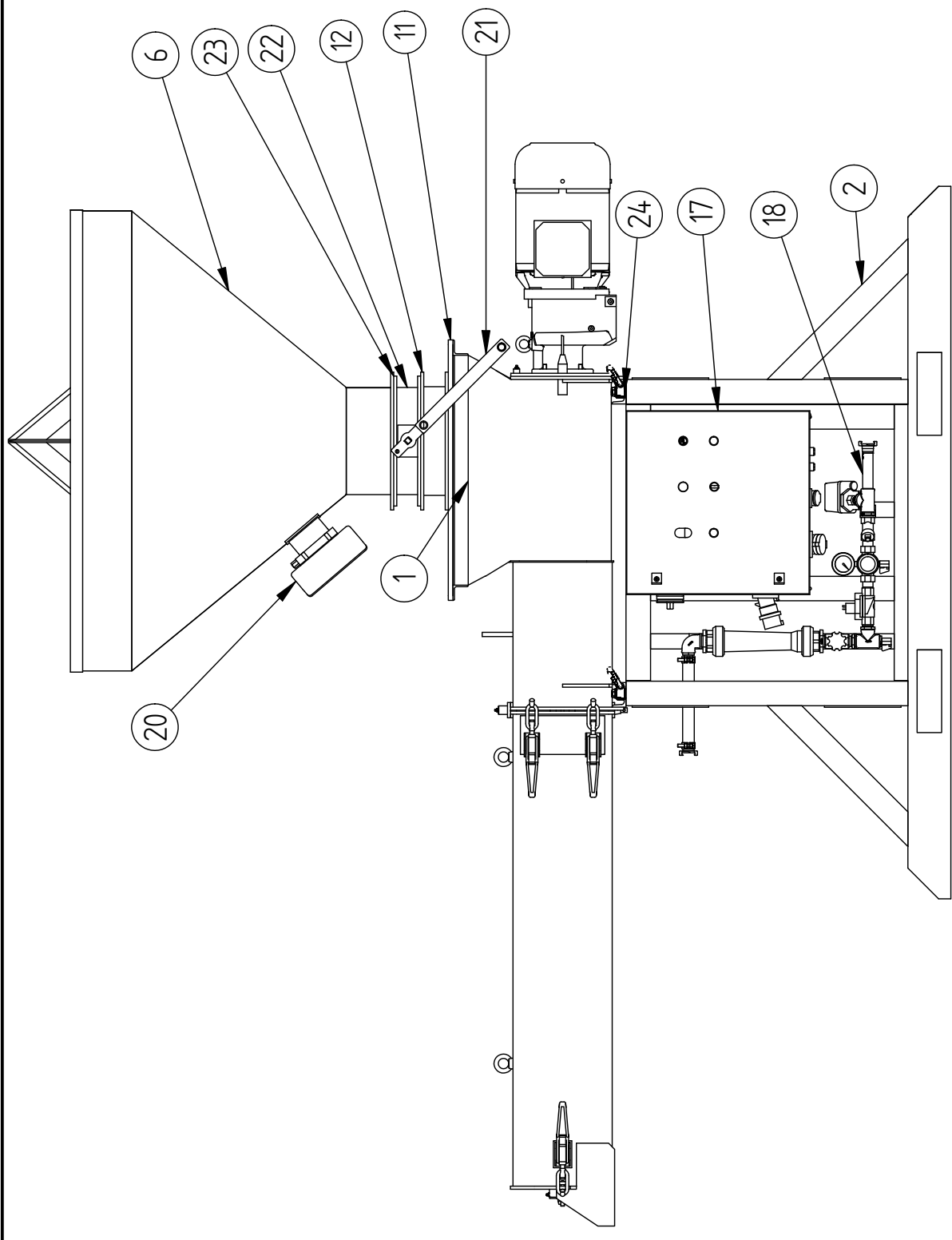
ESTROMAT 403

11 kW / 400 V-440V / 50-60 Hz

Ersatzteilliste
Spare Part List

Art.-Nr. 403.00.002

Stand: 02.2012



Tag	Name	UeLZENER MASCHINEN GmbH
15.02.2012	G.F.	Wiesenstraße 18
Gez.		68843 Sulzbach / Ts
Gepr.		
Norm.		
Rev. A	Name	ESTROMAT 403
Rev. B		mit Maschinengestell
Rev. C		und Aufsatzbehälter 1000 Liter
Rev. D		
Rev. E		

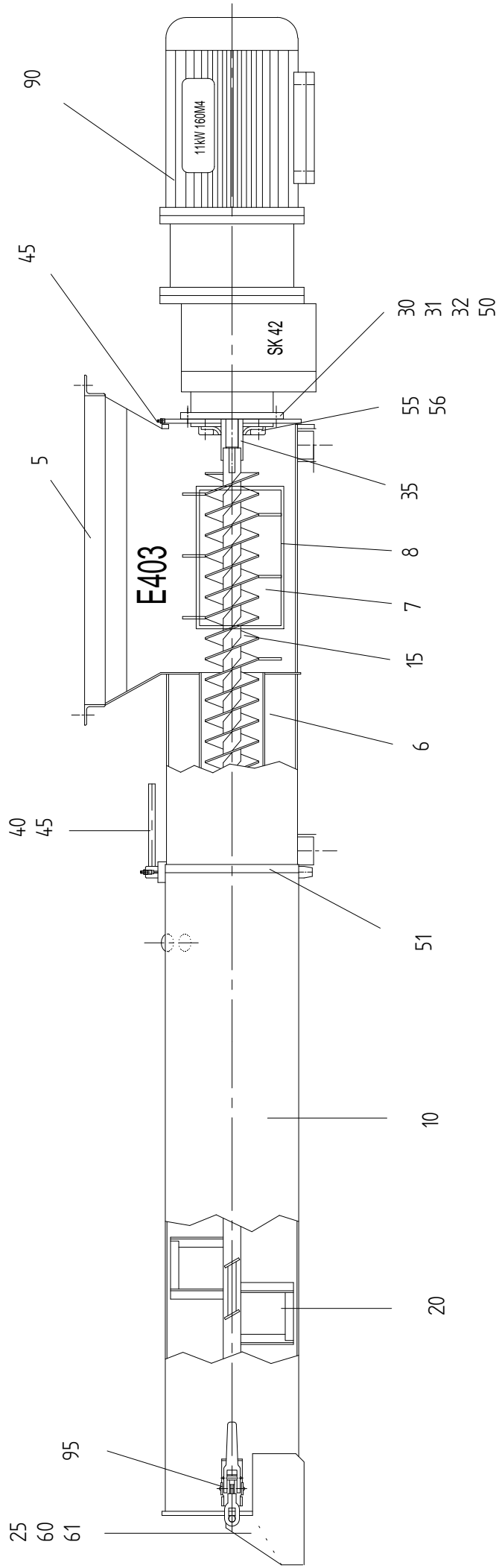
Gez.	Name	UeLZENER MASCHINEN GmbH
15.02.2012	G.F.	Wiesenstraße 18
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Rev. B		mit Maschinengestell
Rev. C		und Aufsatzbehälter 1000 Liter
Rev. D		
Rev. E		

Artikel Nr. 403.00.002
 Art der Änderung
 Tolerierung nach DIN ISO 8015
 Allgem. Toleranzen für Schweiß- und Biegekonstruktionen: DIN 8570 T1B / T3F
 Allgem. Toleranzen für Maßtolerierung, Form und Lage : DIN ISO 2768-m
 Das Urheberrecht an dieser Zeichnung verbleibt bei uns.
 Diese Zeichnung darf weder kopiert noch Dritten zugänglich gemacht oder anderweitig mit oder ohne unsere Zustimmung benutzt werden.


E-1197

CAD: Zeichnungen: s:\d4\041-1197.dwg
 Urspr.:
 Ers. / ver.:
 Ers. durch:
 Masstab 1 : X

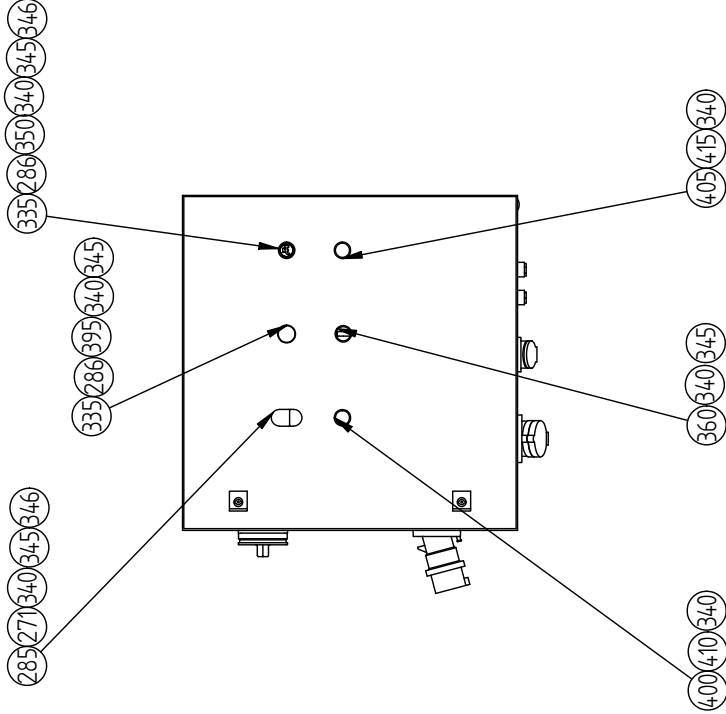
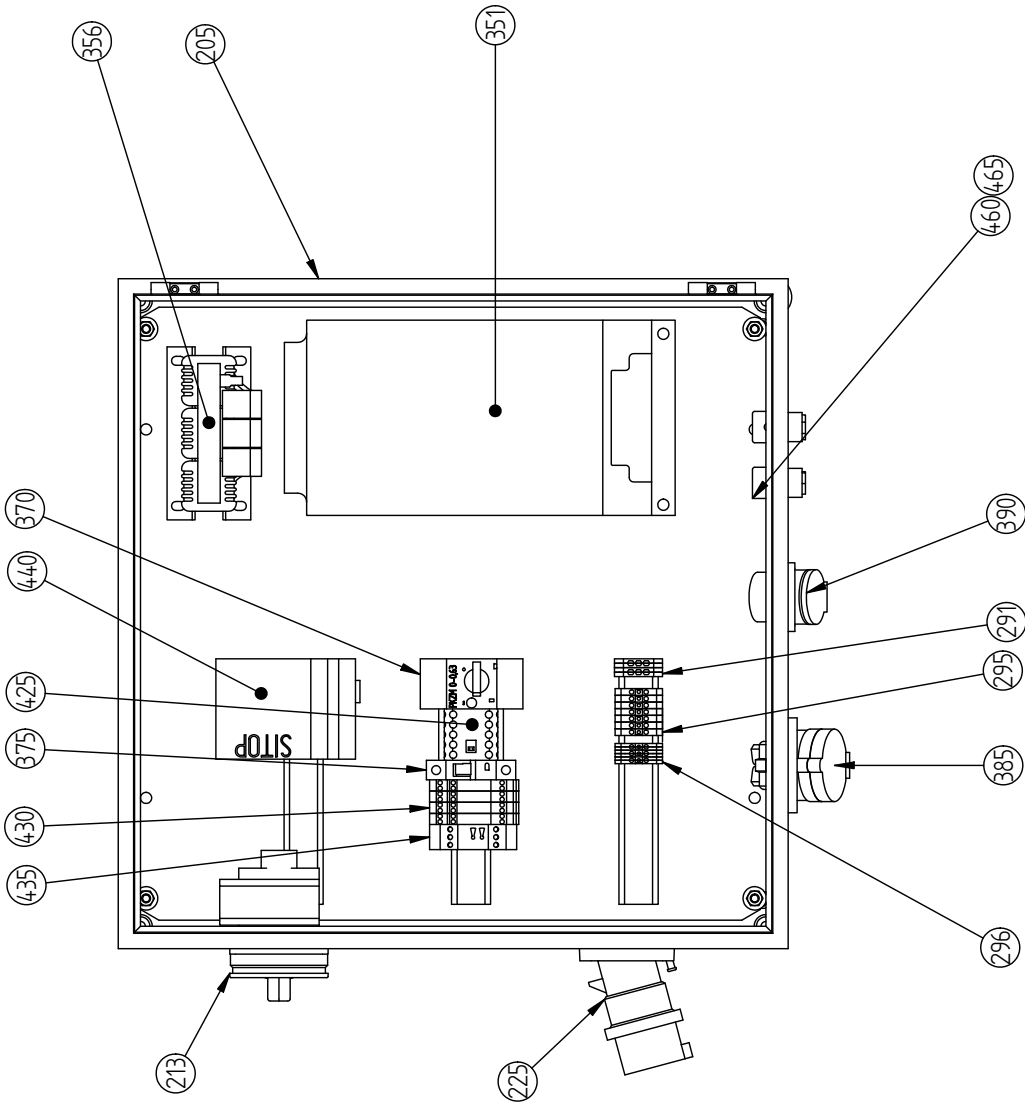
Pos	Anzahl	Artikelnr.	Beschreibung	Description english
Quantity	Part no.			
1	1	403.00.002.01	ESTROMAT 403-11KW/400/50/OST	E 403-11KW WITHOUT CONTR.-B.;WA.-AR
2	1	403.05.098	MASCHINENGESTELL E-403 D-862	MACHINE FRAME E403
6	1	403.06.401.1	AUFSATZSILO 1M3 M.SACKKAUFREISSER	CONTAINER 1M3 W/BIG-BAG CUTTER
11	1	403.20.030.1	UEBERGANGSFLANSCH RECHTECK-DN350	TRANSITION FL. RECTANGLE-ID350
12	1	403.20.031	VERBINDUNGSFLANSCH DN 350	CONNECTING FLANGE 350
17	1	402.11.200.9	EL.STEUER.15KW FU 400V/50 C-2215K	CONTROL BOX 15KW FC C-2215K
18	1	403.07.100.1	WASSERARMATUR 6500L/H C-3806 ETZ	WATER ARMATURE 6500L/H C-3806 ETZ
20	1	130.23.001.1	RUETTLER 400V/50HZ	VIBRATOR 400V/50HZ
21	1	131.12.960.01	GRIFF FUER SILOKLAPPE DN350	HANDLE FOR SILO FLAP ID 350
22	1	131.12.960	SILO-ABSPERRKLAPPE DN350 HANDBET.	BUTTERFLY VALVE ID350 MANUAL
23	2	070.01.012	DICHTUNG DN350 SELBSTKL. B-3723	SEAL ID350 B-3723
24	4	138.98.056	VLBG-LASTBOCK-GEWINDE VLBG 1,5T	VLBG-LOAD RING 1,5T



2011	Tag	Name	Artikel Nr.	E 403	
03.11.	23.11.	Hav	403.00.002.01	Gr. Pos.	
03.11.			403.00.002.05	C-18270ETL	
			Art über-Änderung	CAD: l:\daten\E400\C-1827a.v11	
	Datum	Name		Urspr.	
Rev. A				Ers. fuer	
Rev. B				Ers. durch	
Rev. C				Massestab	
Rev. D				1 : 10	

		UELZENER MASCHINEN GMBH Sulzbach / Ts	
Durchlaufmischer E 403 11KW Rechteckflansch 750 x 650			
Feinmasstoleranz DIN 7168 (mittel)		Das Unternehmen in dieser Zeichnung verleiht bei uns. Diese Zeichnung darf weder kopiert noch fälschlich gemacht oder anderweitig missbraucht werden.	

Option	Pos	Anzahl	Artikelnr.	Beschreibung	Description english
		Quantity	Part no.		
	5	1	403.05.010	TROG M.DOSIERROHR SCHRAUBB.E-245C	TROUGH W. DOSING TUBE E-245C
	6	1	067.10.030.1	DOSIERROHR F.SCHNECKE D110	DOSING TUBE F. SCREW D=110
O	6	1	067.10.030	DOSIERROHR F.SCHNECKE D130 C1614B	DOSING TUBE F. SCREW D=130
O	6	1	403.10.040	DOSIERROHR F.GROBES MAT. C-1614G	DOSING TUBE COARSE GRAINED MAT.
	7	1	403.05.011	DECKEL C-829A	COVER C-829A
	8	1	067.02.026	DICHTUNGSPLATTE TROGKLAPPE B-3228	SEALING PLATE
	10	1	403.01.002.02	MISCHROHR VERST.SCHARNIERE D-476C	MIXING TUBE LONG D-467C
	15	1	403.15.024	TRANSPORTSCHN.D=110,ST=80 D-522R	TRANSPORT SCREW D=110, PITCH 80
O	15	1	403.15.025	TRANSPORTSCHN.D=110,ST=60 D-522S	TRANSPORT SCREW D=110, PITCH 60
O	15	1	403.01.003.1	TRANSPORTSCHN.D=130,ST=100 D-522I	TRANSPORT SCREW D=130,PITCH=100
	20	1	403.10.020	MISCHWELLE LANG D-841	MIXING SHAFT LONG D-841
O	20	1	403.10.020.B	MISCHWELLE (OBERFLAECHE=B) D-841C	MIXING SHAFT WEAR RESISTENT
	25	1	403.01.006	LAGERSCHILD D-1468	BEARING COVER (C-751)
	30	1	067.02.011.1	MOTORPLATTE LK165 ZENTR.130D-520A	MOTOR PLATE LK165
	31	1	067.02.011.2	FLANSCH F.MOT.PLATE LK65 D-520A	FLANGE FOR MOTOR PLATE
	32	1	067.02.011.3	PAPIERDICHT.F.MOT.PL.LK65 D-520A	SEAL FOR MOTOR PLATE
	35	1	403.01.007	KUPPLUNG FUER MISCHWELLE B-1805	COUPLING F.MIXING SHAFT (B-1805)
	40	1	403.05.052	SCHARNIERBOLZEN B-3281	HINGED BOLT B-3281
	45	3	131.11.008	KEG.SCHM.NIPPEL AM8X1GER DIN71412	CONE LUBRICATION NIPPLE AM8X1GER
	50	1	403.01.014	DICHTUNGSPLATTE F.MOTORPL. B-2037	SEALING PLATE (B-2037)
	51	1	403.01.017	DICHTUNGSPLATTE F.TROG B-2038	SEALING PLATE (B-2038)
	55	1	131.09.612	FLACHDICHTUNG 146X60X8 NBR A-592	FLAT SEAL 148X60X8
	56	1	401.01.008	DRUCKFLANSCH A-1028	PRESSURE FLANGE
	60	1	131.07.776	FLANSCHLAG.GEH.FL.206 STAHL C-1026	BLOCK F.FLANGED BALL BEAR.FL.206
O	60	1	131.07.812	FLANSCHLAGER UCFL 206-60	FLANGE BEARING UCFL 206-60
	61	1	131.07.709	RILLENKUGELLAGER GE-30-KPPB-3	GROOVED BALL BEARING GE-30-KPPB-3
	90	1	132.01.971	GEMOT SK42F160M4 11KW/400/50/236U	GEAR MOT.SK42F160 11KW,400/50,236
	95	4	048.01.105	EXZENTERVERSCHL.GR.1 M.SICHER.HAK	EXCENTRIC LOCK WITH SECURITY



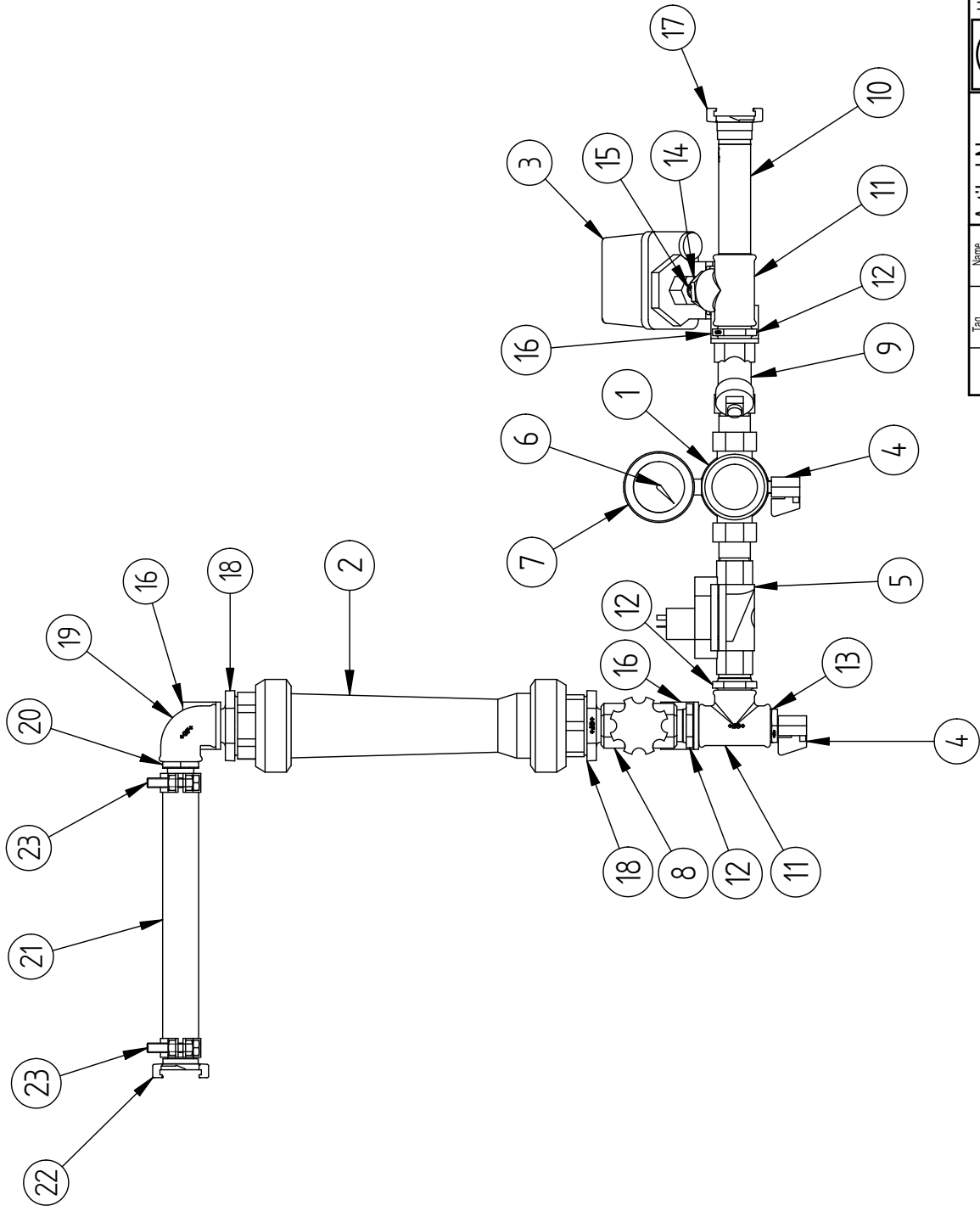
Tag	Name
14.12.2011	T.S.
Gez.	
Gepr.	
Norm.	
Datum	Name
Rev. A	
Rev. B	
Rev. C	
Rev. D	
Rev. E	

	Artikel Nr. 402.11200.9
UELZENER MASCHINEN GmbH Wiesenstraße 18 63843 Sulzbach / Ts	
Schaltkasten E402 + E403	
Art der Änderung	
Tolerierung nach DIN ISO 8015	
Allgem. Toleranzen für Schweiß- und Biegekonstruktionen: DIN 8570 T1B / T3F	
Allgem. Toleranzen für Maßtolerierung, Form und Lage : DIN ISO 2768-m	

Elektro E402 / E403
C-3800ET
CAD-Zeichnungen: soe/ed/ez/eh/eic/soe/ef/eh
Urspr.
Ers.für:
Ers.von:
Massstab 1 : X

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gemacht oder anderweitig missbräuchlich benutzt werden.

Pos	Anzahl	Artikelnr.	Beschreibung	Description english
Quantity	Part no.			
205	1	131.15.456.2	SCHALTSCHRANK 600X600X350	SWITCHBOARD 600X600X350
213	1	131.16.002.10	HAUPT-NOT-AUSSCHALT.P1-32/EA/SVB	MAIN SWITCH P1-32/EA/SVB
225	1	131.15.135.1	CE.ANB.GERAETEST.CGT532/6H 15GR.	PLUG CGT 532/6H
271	1	131.16.775	TASTMEMBRAN M22-T-DD	MEMBRAN M22-T-DD
285	1	131.16.725	DOPPELDRUCKTASTE M22-DDL-GR-X1/XO	PUSH BUTTON M22-DDL-GR-X1/XO
286	2	131.16.775.1	TASTMEMBRAN M22-T-D EINZELTASTER	MEMBRAN M22-T-D
291	2	131.15.963	REIHENKLEMME USLKG10	EARTHING CONDUCTOR CLAMP
295	10	131.15.958	REIHENKLEMME UK5N	SERIES BINDER 4 SQ.MM UK5N
296	5	131.15.959	REIHENKLEMME USLKG5	EARTH CONNECTION BINDER 4SQ.MM
335	2	131.16.720	DRUCKTASTE FL.TAST.M22-D-X	PUSH BUTTON
340	6	131.16.750	BEFESTIGUNGSAAPTER M 22A	ADAPTER M 22A
345	5	131.16.751	KONTAKTELEMENT 1SCHLIESS.M22-K10	NORMALLY OPEN CONTACT BLOCK
346	2	131.16.752	KONTAKTELEMENT 1OEFFNER M22-K01	NORMALLY CLOSED CONTACT BLOCK
350	1	131.16.774	TASTENPLATTE FLUESS.M22-XD-S-X16	KEY LABEL F. WATER
351	1	131.16.599.0	FREQUENZUMR.VFD150-E43A 15KW 3PH.	FREQUENCY CONVERTER 15KW
356	1	131.16.594	NETZDROSSEL RU1020-25-99 25A	POWER CHOKE
360	1	131.16.733	KNEBELGRIFF V-STELL-1-2 M22-WKV	TOGGLE CONTROL 1-2 M22-WKV
370	1	131.16.101	MOTORSCHUTZSCHALTER PKZM0-1,6	PROTECTIVE MOTOR SWITCH 1-1,6 A
375	1	131.16.613	LEITUNGSSCHUTZSCHALTER FAZ-C2/1	OVERLOAD RELEASE K 2A
385	1	131.15.185	CEKON-ANBAUDOSE CL 532/6H	CEKON-SOCKET-PLUG CL 532/6H
390	1	131.15.160	CEKON-ANBAUDOSE CL416/6H	CEKON SOCKET CL 416/6H
395	1	131.16.773	TASTENPL.RESET BL.M22-XD-B-X6	KEY LABEL REVERSE
400	1	131.16.742	LEUCHTMELDER FL.GRUEN M22-L-G	CONTROL LAMP GREEN M22-L-G
405	1	131.16.741	LEUCHTMELDER FL.ROT M22-L-R	CONTROL LAMP RED M22-L-R
410	1	131.16.762	LED-EL.12-30VAC/DC GRUENM22-LED-G	LED 12-30VACDC GREEN M22-LED-G
415	1	131.16.761	LED-EL.12-30VAC/DC ROT M22-LED-R	LED 12-30VACDC RED M22
425	1	131.16.216.1	KLEINSCHUETZ DILEM-10-G 24VDC	SMALL CONTACTOR DIL EM-10-G-24DC
430	4	131.16.233	RELAIS WRS-REL-1W-250V5A 24VDC	RELAIS
435	1	131.16.307	MULTIFUNKTIONRELAYS ETR4-69A	MULTI TIME LAG RELAY TE 69-A
440	1	131.16.547.2	NETZTEIL 120-500V/24VDC 10A	MAINS SUPPLY CIRCUIT 10A 1/PH 24VDC
460	2	131.15.616	KABELVERSCHR.M16X1,5;D=4-8 (9)	SCREW JOINT PG 13,5
465	2	131.15.642	KONTERMUTTER M16X1,5 KUNSTSTOFF	CHECK NUT M16X1,5 PLASTIC



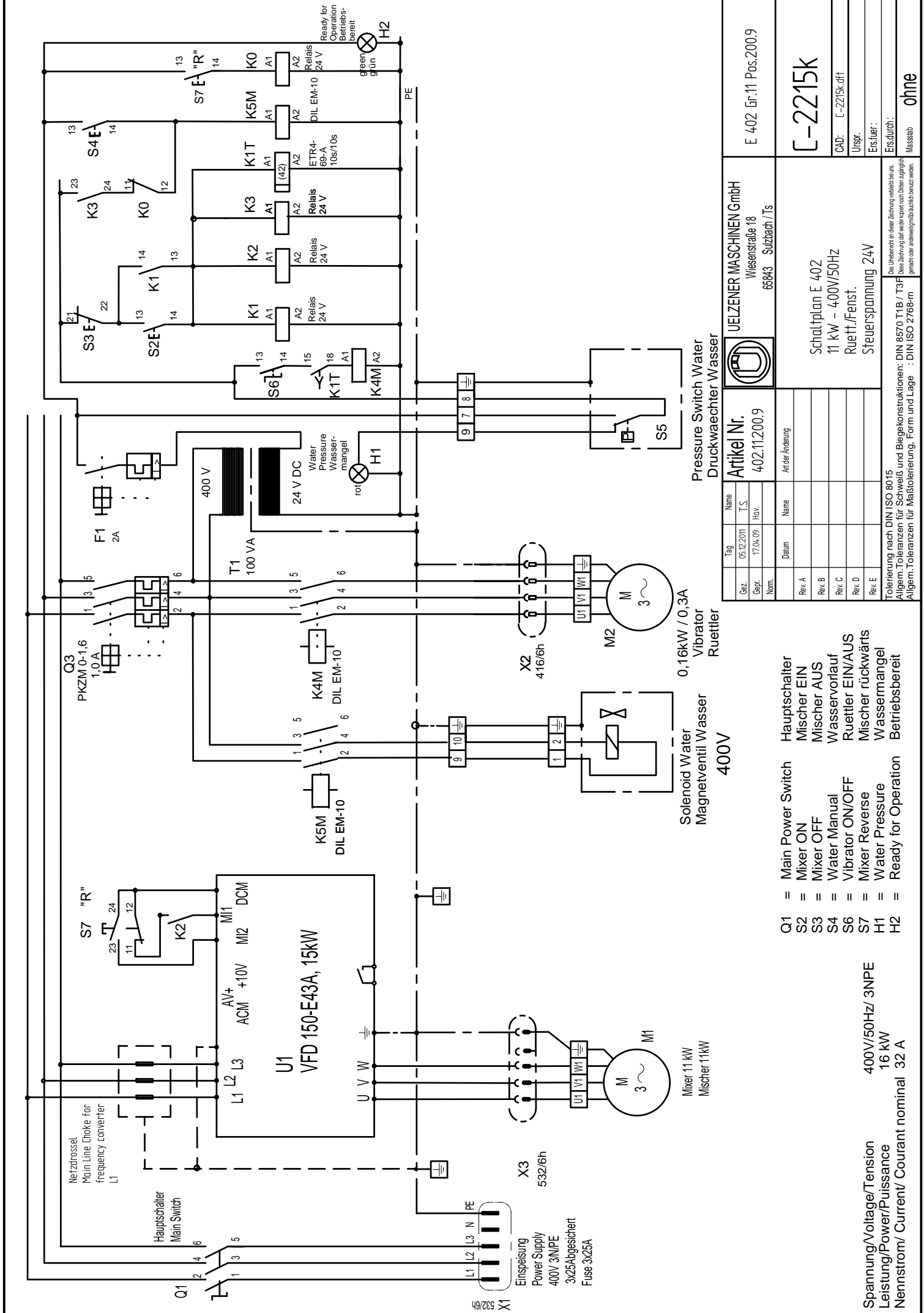
Tag	Name	Uetzener Maschinen GmbH
Gez.	16.02.2012	Wiesenstraße 18
Gepr.		63843 Sulzbach / Ts
Norm.		
Rev. A	Datum	Name
Rev. B		
Rev. C		
Rev. D		
Rev. E		

Artikel Nr.	40307.100.1
	
Wasserarmatur R1' 650-6500 L/h	
C-3806 ETL	
Urspr.: Erschuer.: Ersch.durch.: Massstab 1 : X	

Tolerierung nach DIN ISO 8015
 Allgem. Toleranzen für Schweiß- und Biegekonstruktionen: DIN 8570 T1B / T3F
 Allgem. Toleranzen für Maßtolerierung, Form und Lage : DIN ISO 2768-m

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Pos	Anzahl	Artikelnr.	Beschreibung	Description english
Quantity	Part no.			
1	1	131.13.331	DRUCKMINDERER D06F-1"A-R1"	PRESURE REDUCING VALVE D06F 1R1
2	1	131.13.076	MESSROHR TROGFLUX TS 650-6500L/H	LOOKING GLAS F.FLOW METER 6500 L
3	1	131.13.030	DRUCKWAECHTER R3/8" FF4-4DAHV	PRESSURE CONTROL DEVICE R3/8"
4	2	131.13.116	MINI-KUGELHAHN R1/4"IA GR.ROT	RELIEF VALVE R 1/4" IA
5	1	131.12.817.1	2/2-WEGEVENT.TYP 5282 1" 24V=	MAGN.VALVE 5282
6	1	131.12.752	MANOMETER 10 BAR D63 R1/4" SENKR.	MANOMETER 10 BAR D63 R1/4",VERTI
7	1	131.12.791	MANOMETER-SCHUTZKAPPE D=63 BLAU	RUBBER COVER,BLUE F.PR.GAUGE D=63
8	1	131.12.745.1	NADELVENTIL R1"IG VERGR.DURCHGANG	NEEDLE VALVE R1"IG
9	1	131.13.379	SCHMUTZFAENGER R1" NR.60-5/K	MUD FLAP
10	1	131.12.497	ROHR-DOPP.NIPPEL 530 R1"X160 VERZ	TWIN BARREL NIPPLE 530 R1"X160
11	2	131.12.146	T-STUECK 130 R1" VERZ. DIN 2950	T-PIECE 130 R 1", GALV.
12	3	131.12.387	DOPPELNIPPEL 280 R1" VERZ.	TWIN NIPPLE 280 R1",GALV.
13	1	131.12.293	REDUZIERUNG 241 R1-1/4" VERZ.	REDUC.NIPPLE 241 R1"-1/4", GALV.
14	1	131.12.294	REDUZIERUNG 241 R1-3/8" VERZ.	REDUCING NIPPLE 241 R1"-3/8" GALV
15	1	131.12.384	DOPPELNIPPEL 280 R3/8" VERZ.	TWIN NIPPLE 280 R3/8" GALV.
16	3	115.04.620	BEFESTIGUNGSWINKEL T115 B-4609	ANGLE T115 B-4609
17	1	131.14.243	GK-KUPPLUNG R 1" IG	GEKA-COUPLING R 1" IT
18	2	131.12.342	DOPPELNIPPEL 245 R 2-1",VERZ.	TWIN NIPPLE 245 R2"-1", GALV.
19	1	131.12.092	WINKEL NR.90 R1" 2XIG VERZ.	ELBOW NO.90 R1" 2XIG
20	1	131.14.018	SCHLAUCHTUELLE 1"XR1"AG-MS	HOSE NOZZLE 1" X 1" O.THR.
21	1,2	130.04.105.01	MOERTELSCHLAUCH 25X7, METERWARE	MORTAR HOSE 25X7
22	1	131.14.211	GK-KUPPL.TUELLE 1"	GK-COUPLING WITH NOZZLE 1"
23	2	131.14.628	NORMA-SCHLAUCHSCHELLE 38 X 20	NORMA HOSE CLAMP 38 X 20



- Q1 = Main Power Switch
- S2 = Mixer ON
- S3 = Mixer OFF
- S4 = Water Manual
- S6 = Vibration ON/OFF
- S7 = Mixer Reverse
- H1 = Water Pressure
- H2 = Ready for Operation

Spannung/Voltage/Tension 400V/50Hz/ 3NPE
 Leistung/Power/Puissance 16 kW
 Nennstrom/ Current/ Courant nominal 32 A

Tag	Name	Rev. A	Rev. B	Rev. C	Rev. D	Rev. E
05.12.2011	T.S.					
Gez.						
17.04.09	Hrv.					
Norm.						
Datum	Name	Änder-Änderung				
UELZENER MASCHINEN GmbH Wiesenstr. 18 66843 Sulzbach / Ts						
Artikel Nr. 402.11.200.9						
Schaltplan E 402 11 kW - 400V/50Hz Ruett./Fenst. Steuerungsspannung 24V						
E 402 Gr.11 Pos.200.9						
C-2215k						
CAD: C-2215k.dft						
U/spr.						
Ers./Iur.						
Es/durch:						
Massstab ohne						

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Quickstart Guide Drive Controller PDC



We put ideas into gear.

ABM Greiffenberger Antriebstechnik

Preface

Thank you for choosing ABM's high-performance PDC Series. The PDC Series is manufactured with high-quality components and materials and incorporate the latest microprocessor technology available.

Getting Started

This quick start will be helpful in the installation and parameter setting of the AC motor drives. To guarantee safe operation of the equipment, read the following safety guidelines before connecting power to the AC motor drives. For detail information, refer to the PDC User Manual on the CD supplied with the drive.



-
1. AC input power must be disconnected before any wiring to the AC motor drive is made.
 2. A charge may still remain in the DC-link capacitors with hazardous voltages, even if the power has been turned off. To prevent personal injury, please ensure that power has turned off before opening the AC motor drive and wait ten minutes for the capacitors to discharge to safe voltage levels.
 3. Never reassemble internal components or wiring.
 4. The AC motor drive may be destroyed beyond repair if incorrect cables are connected to the input/output terminals. Never connect the AC motor drive output terminals U/T1, V/T2, and W/T3 directly to the AC mains circuit power supply.
 5. Ground the PDC using the ground terminal. The grounding method must comply with the laws of the country where the AC motor drive is to be installed. Refer to the Basic Wiring Diagram.
 6. PDC series is used only to control variable speed of 3-phase induction motors, NOT for 1-phase motors or other purpose.
 7. PDC series is the specific drive for the elevator door and other automatic door control, NOT for those devices that may cause personal injury, such as life support equipment or any life safety situation.
 8. To prevent drive damage, the RFI jumper connected to ground shall be cut off if the AC motor drive is installed on an ungrounded power system or a high resistance-grounded (over 30 ohms) power system or a corner grounded TN system.



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1. DO NOT use Hi-pot test for internal components. The semi-conductor used in AC motor drive easily damage by high-pressure.
 2. There are highly sensitive MOS components on the printed circuit boards. These components are especially sensitive to static electricity. To prevent damage to these components, do not touch these components or the circuit boards with metal objects or your bare hands.
 3. Only quality person is allowed to install, wire and maintain AC motor drive.








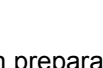
-
1. Some parameters settings can cause the motor to run immediately after applying power.
 2. DO NOT install the AC motor drive in a place subjected to high temperature, direct sunlight, high humidity, excessive vibration, corrosive gases or liquids, or airborne dust or metallic particles. Only use AC motor drives within specification. Failure to comply may result in fire, explosion or electric shock. To prevent personal injury, please keep children and unqualified people away from the equipment.
 3. When the motor cable between AC motor drive and motor is too long, the layer insulation of the motor may be damaged. Please use a frequency inverter duty motor or add an AC output reactor to prevent damage to the motor. Refer to appendix B Reactor for details.
 4. The rated voltage for AC motor drive must be $\leq 240V$ and the mains supply current capacity must be $\leq 5000A$ RMS.

Specifications

Voltage Class		115V Class		
Model Number PDC-11.XXX-A		002	004	007
Max. Applicable Motor Output (kW)		0.2	0.4	0.75
Max. Applicable Motor Output (hp)		0.25	0.5	1.0
Output Rating	Rated Output Capacity (kVA)	0.6	1.0	1.6
	Rated Output Current (A)	1.6	2.5	4.2
	Maximum Output Voltage (V)	3-Phase Proportional to Twice the Input Voltage		
	Output Frequency (Hz)	0.1~600 Hz		
	Carrier Frequency (kHz)	1-15		
Input Rating	Rated Input Current (A)	Single-phase		
		6	9	18
	Rated Voltage/Frequency	Single phase, 100-120V, 50/60Hz		
	Voltage Tolerance	± 10%(90~132 V)		
	Frequency Tolerance	± 5%(47~63 Hz)		
Cooling Method		Natural Cooling		Fan Cooling
Weight (kg)		1.2	1.2	1.2

Voltage Class		230V Class							
Model Number PDC-X2.XXX-A		002	004	007	015	022	037	055	075
Max. Applicable Motor Output (kW)		0.2	0.4	0.75	1.5	2.2	3.7	5.5	7.5
Max. Applicable Motor Output (hp)		0.25	0.5	1.0	2.0	3.0	5.0	7.5	10
Output Rating	Rated Output Capacity (kVA)	0.6	1.0	1.6	2.9	4.2	6.5	9.5	12.5
	Rated Output Current (A)	1.6	2.5	4.2	7.5	11.0	17	25	33
	Maximum Output Voltage (V)	3-Phase Proportional to Input Voltage							
	Output Frequency (Hz)	0.1~600 Hz							
	Carrier Frequency (kHz)	1-15							
Input Rating	Rated Input Current (A)	Single/3-phase					3-phase		
		4.9/1.9	6.5/2.7	9.5/5.1	15.7/9	24/15	20.6	26	34
	Rated Voltage/Frequency	Single/3-phase 200-240 V, 50/60Hz					3-phase 200-240V, 50/60Hz		
	Voltage Tolerance	± 10%(180~264 V)							
	Frequency Tolerance	± 5%(47~63 Hz)							
Cooling Method		Natural Cooling			Fan Cooling				
Weight (kg)		1.1	1.1	1.1	1.9	1.9	1.9	3.5	3.5

Voltage Class		460V Class							
Model Number PDC-34.XXX-A		004	007	015	022	037	055	075	110
Max. Applicable Motor Output (kW)		0.4	0.75	1.5	2.2	3.7	5.5	7.5	11
Max. Applicable Motor Output (hp)		0.5	1.0	2.0	3.0	5.0	7.5	10	15
Output Rating	Rated Output Capacity (kVA)	1.2	2.0	3.3	4.4	6.8	9.9	13.7	18.3
	Rated Output Current (A)	1.5	2.5	4.2	5.5	8.2	13	18	24
	Maximum Output Voltage (V)	3-Phase Proportional to Input Voltage							
	Output Frequency (Hz)	0.1~600 Hz							
	Carrier Frequency (kHz)	1-15							
Input Rating	Rated Input Current (A)	3-phase							
		1.9	3.2	4.3	7.1	11.2	14	19	26
	Rated Voltage/Frequency	3-phase, 380-480V, 50/60Hz							
	Voltage Tolerance	± 10%(342~528V)							
	Frequency Tolerance	± 5%(47~63Hz)							
Cooling Method		Natural Cooling			Fan Cooling				
Weight (kg)		1.2	1.2	1.2	1.9	1.9	4.2	4.2	4.2

General Specifications			
Control Characteristics	Control System	SPWM(Sinusoidal Pulse Width Modulation) control (V/f or sensorless vector control)	
	Frequency Setting Resolution	0.01Hz	
	Output Frequency Resolution	0.01Hz	
	Torque Characteristics	Including the auto-torque/auto-slip compensation; starting torque can be 150% at 3.0Hz	
	Overload Endurance	150% of rated current for 1 minute	
	Skip Frequency	Three zones, setting range 0.1-600Hz	
	Accel/Decel Time	0.1 to 600 seconds (2 Independent settings for Accel/Decel time)	
	Stall Prevention Level	Setting 20 to 250% of rated current	
	DC Braking	Operation frequency 0.1-600.0Hz, output 0-100% rated current Start time 0-60 seconds, stop time 0-60 seconds	
	Regenerated Braking Torque	Approx. 20% (up to 125% possible with optional brake resistor or externally mounted brake unit, 1-15hp (0.75-11kW) models have brake chopper built-in)	
	V/f Pattern	Adjustable V/f pattern	
Operating Characteristics	Frequency Setting	Keypad	Setting by  
		External Signal	Potentiometer-5kΩ/0.5W, 0 to +10VDC, 4 to 20mA, RS-485 interface; Multi-function Inputs 3 to 9 (15 steps, Jog, up/down)
	Operation Setting Signal	Keypad	Set by RUN and STOP
		External Signal	2 wires/3 wires (MI1, MI2, MI3), JOG operation, RS-485 serial interface (MODBUS), programmable logic controller
	Multi-function Input Signal	Multi-step selection 1 to 15, Jog, accel/decel inhibit, 2 accel/decel switches, counter, , external Base Block, auxiliary motor control is invalid, ACI/AVI selections, driver reset, UP/DOWN key settings, NPN/PNP input selection	
	Multi-function Output Indication	AC drive operating, frequency attained, zero speed, Base Block, fault indication, overheat alarm, emergency stop and status selections of input terminals	
	Analog Output Signal	Output frequency/current	
Alarm Output Contact		Contact will be On when drive malfunctions (1 Form C/change-over contact and 1 open collector output) for standard type)	
Operation Functions		Built-in PLC, AVR, accel/decel S-Curve, over-voltage/over-current stall prevention, 5 fault records, reverse inhibition, momentary power loss restart, DC braking, auto torque/slip compensation, auto tuning, adjustable carrier frequency, output frequency limits, parameter lock/reset, vector control, PID control, external counter, MODBUS communication, abnormal reset, abnormal re-start, power-saving, fan control, sleep/wake frequency, 1st/2nd frequency source selections, 1st/2nd frequency source combination, NPN/PNP selection	
Protection Functions		Over voltage, over current, under voltage, external fault, overload, ground fault, overheating, electronic thermal, IGBT short circuit, PTC	
Display Keypad		6-key, 7-segment LED with 4-digit, 5 status LEDs, master frequency, output frequency, output current, custom units, parameter values for setup and lock, faults, RUN, STOP, RESET, FWD/REV, PLC	
Environmental Conditions	Enclosure Rating	IP20	
	Pollution Degree	2	
	Installation Location	Altitude 1,000 m or lower, keep from corrosive gasses, liquid and dust	
	Ambient Temperature	-10°C to 50°C (40°C for side-by-side mounting) Non-Condensing and not frozen	
	Storage/ Transportation Temperature	-20 °C to 60 °C	
	Ambient Humidity	Below 90% RH (non-condensing)	
	Vibration	9.80665m/s ² (1G) less than 20Hz, 5.88m/s ² (0.6G) at 20 to 50Hz	
Approvals		   	

Basic Wiring Diagram

Users must connect wiring according to the following circuit diagram shown below.

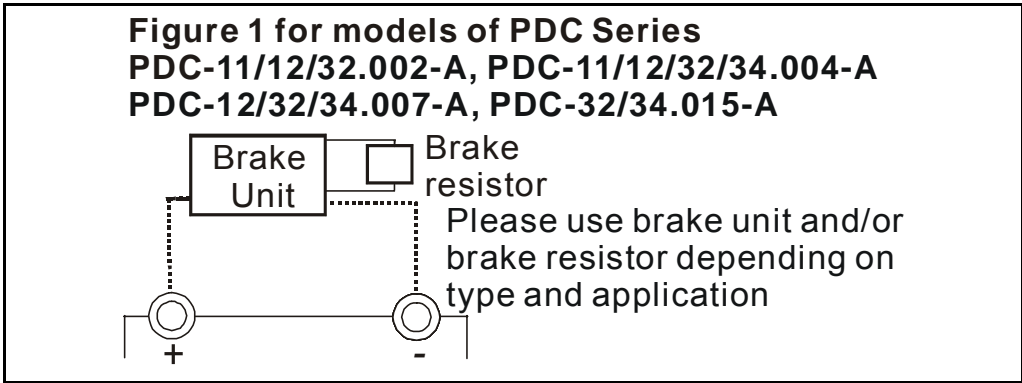
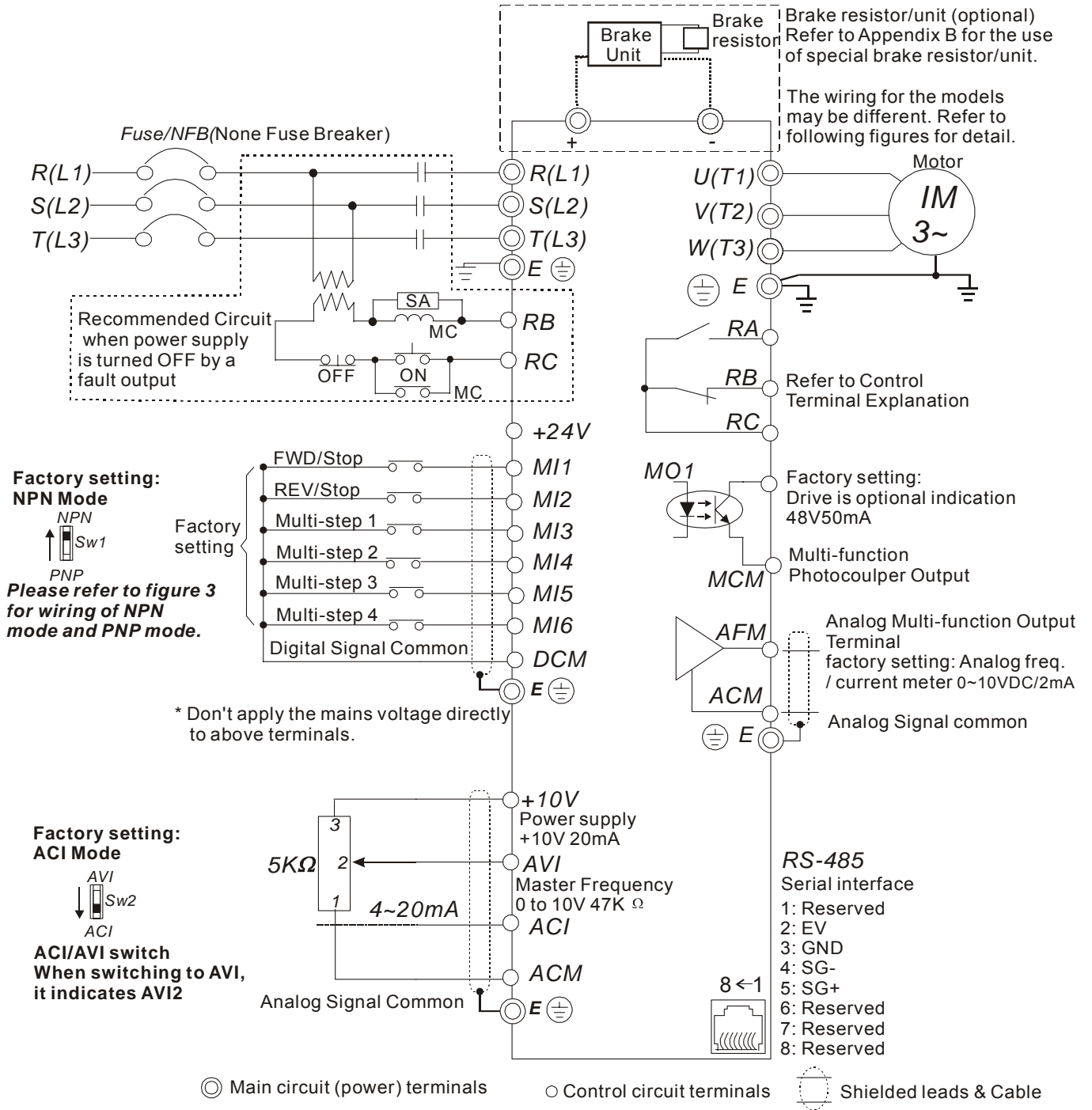


Figure 2 for models of PDC Series
PDC-11.007-A, PDC-12.015-A, PDC-12/32/34.022-A,
PDC-32/34.037-A, PDC-32/34.055-A,
PDC-32/34.075-A, PDC-34.110-A

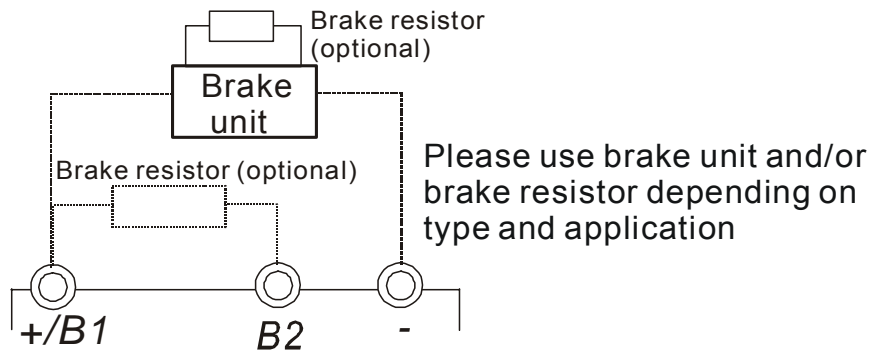
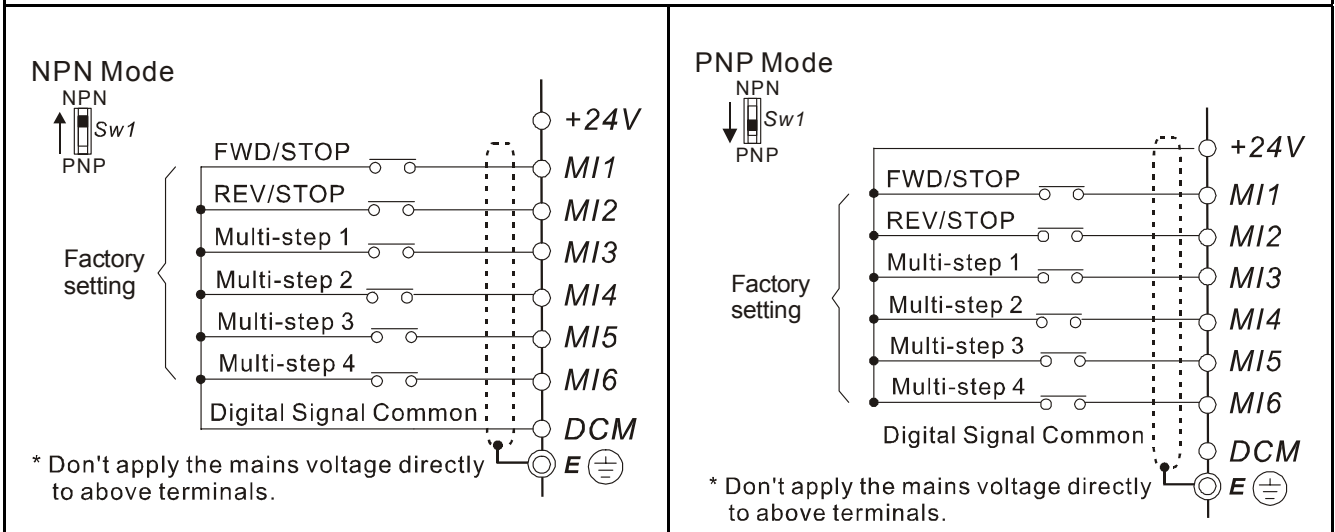
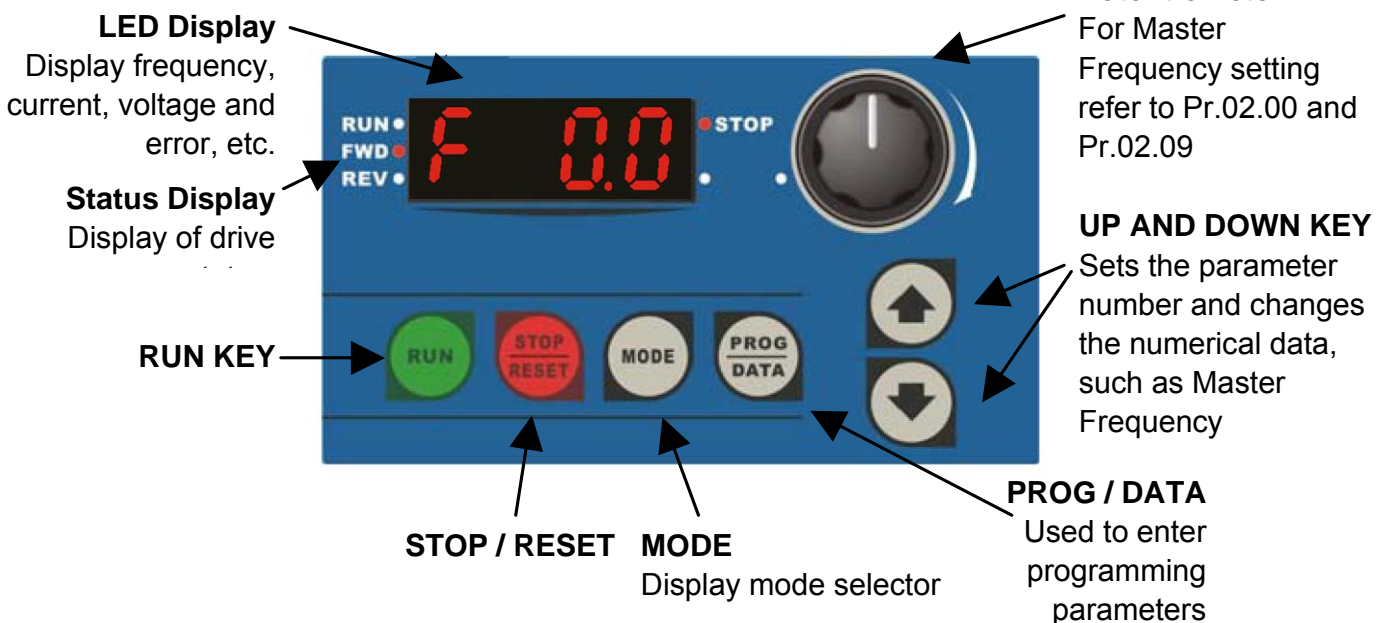


Figure 3 Wiring for NPN mode and PNP mode

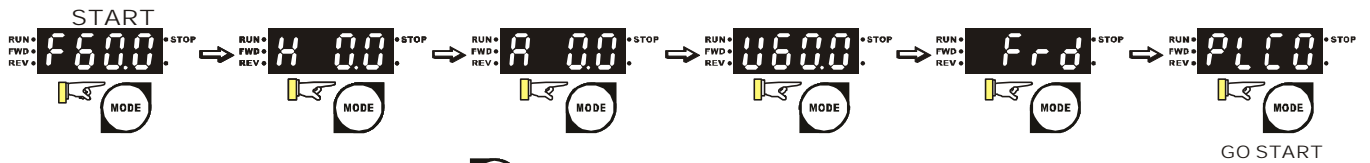


Description of the Digital keypad PDC-KP01



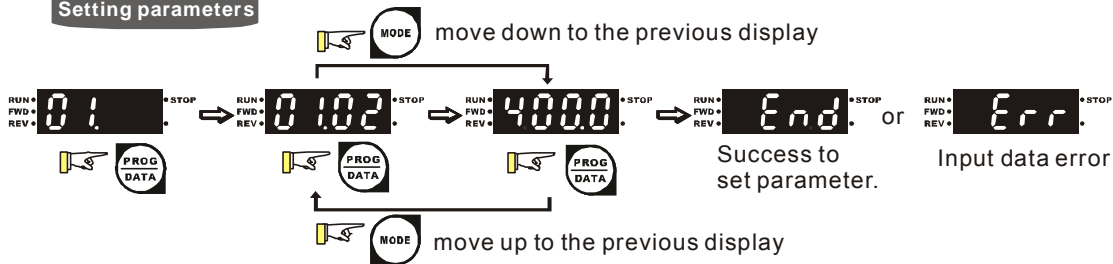
Operation steps of the Digital Keypad

Setting Mode



Note : In the selection mode, press to set the parameters.

Setting parameters

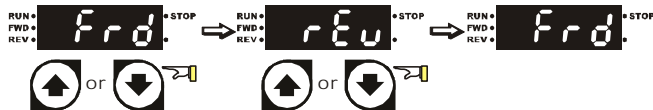


NOTE : In the parameter setting mode, you can press to return the selecting mode.

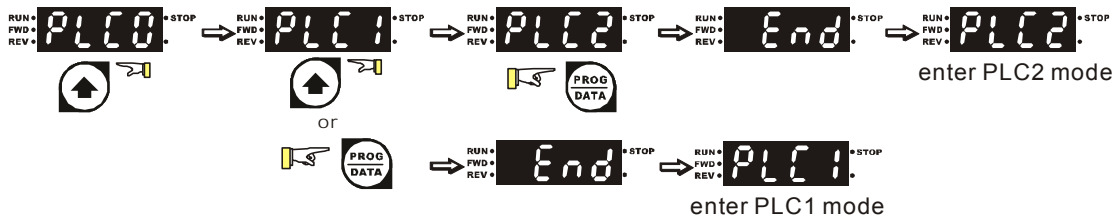
To shift data



Setting direction (When operation source is digital keypad)

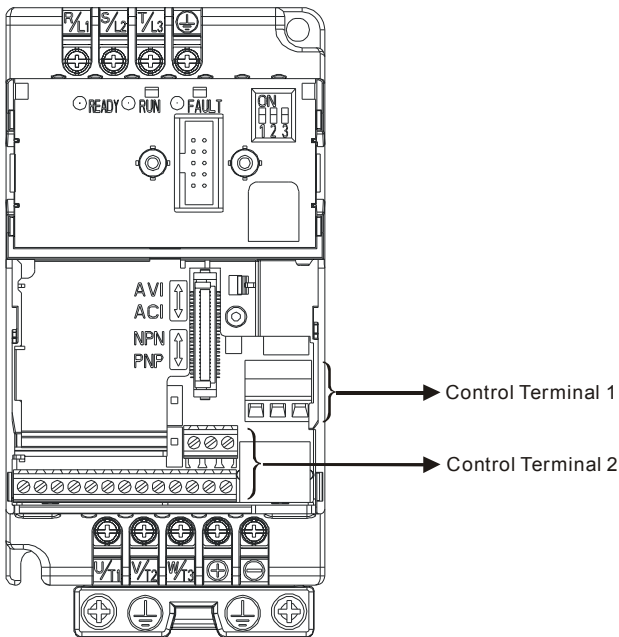


Setting PLC Mode



Power Terminals and Control Terminals

Frame A: PDC-11/12/32.002-A, PDC-11/12/32/34.004-A, PDC-12/32/34.007-A, PDC-32/34.015-A

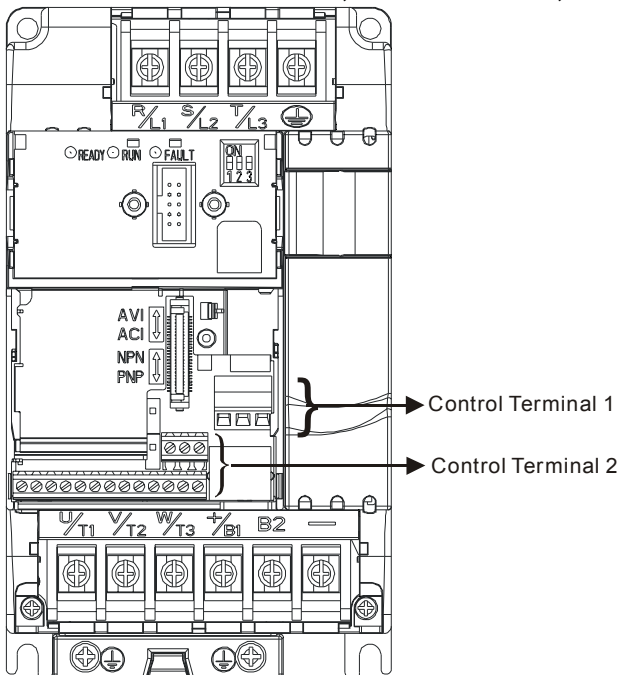


Control Terminal 1:
Torque: 5kgf-cm (4.4 lbf-in)
Wire Gauge: 12-24 AWG (3.3-0.2mm²)

Control Terminal 2:
Torque: 2kgf-cm (2 lbf-in)
Wire Gauge: 16-24 AWG (1.3-0.2mm²)

Power Terminal:
Torque: 14 kgf-cm (12 lbf-in)
Wire Gauge: 12-14 AWG (3.3-2.1mm²)
Wire Type: Copper only, 75°C

Frame B: PDC-11.007-A, PDC-12.015-A, PDC-12/32/34.022-A, PDC-32/34.037-A

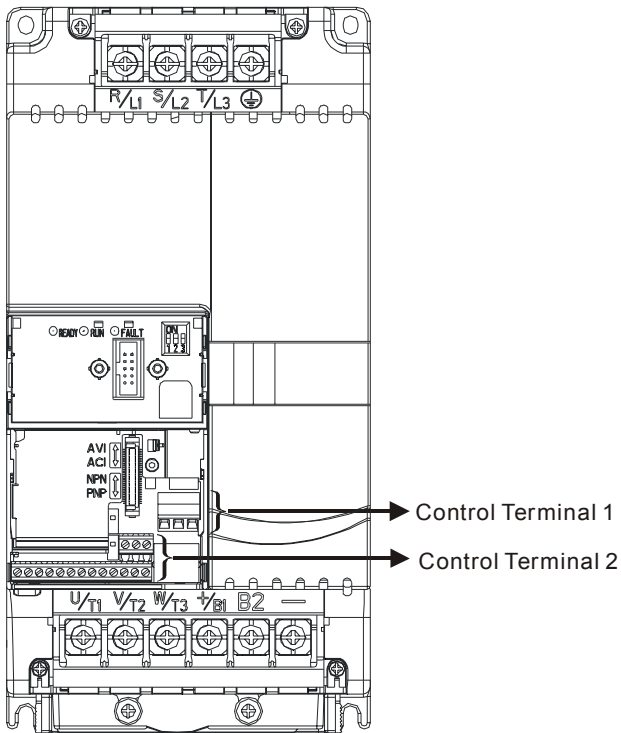


Control Terminal 1:
Torque: 5kgf-cm (4.4 lbf-in)
Wire Gauge: 12-24 AWG (3.3-0.2mm²)

Control Terminal 2:
Torque: 2kgf-cm (2 lbf-in)
Wire Gauge: 16-24 AWG (1.3-0.2mm²)

Power Terminal:
Torque: 18 kgf-cm (15.6 lbf-in)
Wire Gauge: 8-18 AWG (8.4-0.8mm²)
Wire Type: Copper only, 75°C

Frame C: PDC-32/34.055-A, PDC-32/34.075-A, PDC-34.110-A



Control Terminal 1:
Torque: 5kgf-cm (4.4 lbf-in)
Wire Gauge: 12-24 AWG (3.3-0.2mm²)

Control Terminal 2:
Torque: 2kgf-cm (2 lbf-in)
Wire Gauge: 16-24 AWG (1.3-0.2mm²)

Power Terminal:
Torque: 30 kgf-cm (26 lbf-in)
Wire Gauge: 8-16 AWG (8.4-1.3mm²)
Wire Type: Copper only, 75°C

Terminal Explanations

Terminal Symbol	Explanation of Terminal Function
R/L1, S/L2, T/L3	AC line input terminals (1-phase/3-phase)
U/T1, V/T2, W/T3	AC drive output terminals for connecting 3-phase induction motor
+/B1~ B2	Connections for Brake resistor (optional)
+/B1, -	Connections for External Brake unit (BUE series)
⊕	Earth connection, please comply with local regulations.

Control Terminals Explanations

Terminal Symbol	Terminal Function	Factory Settings (NPN mode) ON: Connect to DCM
MI1	Forward-Stop command	ON: Run in MI1 direction OFF: Stop acc. to Stop Method
MI2	Reverse-Stop command	ON: Run in MI2 direction OFF: Stop acc. to Stop Method
MI3	Multi-function Input 3	Refer to Pr.04.05 to Pr.04.08 for programming the Multi-function Inputs. ON: the activation current is 16mA. OFF: leakage current tolerance is 10 μA.
MI4	Multi-function Input 4	
MI5	Multi-function Input 5	
MI6	Multi-function Input 6	
+24V	DC Voltage Source	+24VDC, 20mA used for PNP mode.
DCM	Digital Signal Common	Common for digital inputs and used for NPN mode.

Terminal Symbol	Terminal Function	Factory Settings (NPN mode) ON: Connect to DCM
RA	Multi-function Relay output (N.O.) a	Resistive Load: 5A(N.O.)/3A(N.C.) 240VAC 5A(N.O.)/3A(N.C.) 24VDC Inductive Load: 1.5A(N.O.)/0.5A(N.C.) 240VAC 1.5A(N.O.)/0.5A(N.C.) 24VDC Refer to Pr.03.00 for programming
RB	Multi-function Relay output (N.C.) b	
RC	Multi-function Relay common	
MO1	Multi-function Output 1 (Photocoupler)	<p>Maximum 48VDC, 50mA Refer to Pr.03.01 for programming</p>
MCM	Multi-function output common	Common for Multi-function Outputs
+10V	Potentiometer power supply	+10VDC 20mA
AVI	<p>Analog voltage Input</p>	<p>Impedance: 47kΩ Resolution: 10 bits Range: 0 ~ 10VDC = 0 ~ Max. Output Frequency (Pr.01.00) Selection: Pr.02.00, Pr.02.09, Pr.10.00 Set-up: Pr.04.14 ~ Pr.04.17</p>
ACI	<p>Analog current Input</p>	<p>Impedance: 250Ω Resolution: 10 bits Range: 4 ~ 20mA = 0 ~ Max. Output Frequency (Pr.01.00) Selection: Pr.02.00, Pr.02.09, Pr.10.00 Set-up: Pr.04.18 ~ Pr.04.21</p>
AFM	<p>Analog output meter</p> <p>ACM circuit</p> <p>0~10V potentiometer Max. 2mA</p>	<p>0 to 10V, 2mA Impedance: 20kΩ Output current: 2mA max Resolution: 8 bits Range: 0 ~ 10VDC Function: Pr.03.03 to Pr.03.04</p>
ACM	Analog control signal (common)	Common for AVI, ACI, AFM

Summary of Parameter Settings

↗: The parameter can be set during operation.

Parameter	Explanation	Settings	Factory Setting	Customer
Group 0 User Parameters				
00.00	Identity Code of the AC motor drive	Read-only	##	
00.01	Rated Current Display of the AC motor drive	Read-only	##	
00.02	Parameter Reset	1: All parameters are read only 6: Clear PLC program 9: All parameters are reset to factory settings (50Hz, 230V/400V or 220V/380V depends on Pr.00.12) 10: All parameters are reset to factory settings (60Hz, 220V/440V)	0	
↗00.03	Start-up Display Selection	0: Display the frequency command value (Fxxx) 1: Display the actual output frequency (Hxxx) 2: Display the content of user-defined unit (Uxxx) 3: Multifunction display, see Pr.00.04 4: FWD/REV command 5: PLCx (PLC selections: PLC0/PLC1/PLC2)	0	
↗00.04	Content of Multifunction Display	0: Display the content of user-defined unit (Uxxx) 1: Display the counter value (c) 2: Display PLC D1043 value (C) 3: Display DC-BUS voltage (u) 4: Display output voltage (E) 5: Display PID analog feedback signal value (b) (%) 6: Output power factor angle (n) 7: Display output power (P) 8: Display the estimated value of torque as it relates to current (t) 9: Display AVI (I) (V) 10: Display ACI / AVI2 (i) (mA/V) 11: Display the temperature of IGBT (h) (°C)	0	
↗00.05	User-Defined Coefficient K	0.1 to 160.0	1.0	
00.06	Power Board Software Version	Read-only	###	
00.07	Control Board Software Version	Read-only	###	
00.08	Password Input	0 to 9999	0	
00.09	Password Set	0 to 9999	0	
00.10	Control Method	0: V/f Control 1: Vector Control	0	
00.11	Reserved			
00.12	50Hz Base Volt Selection	0: 230V/400V 1: 220V/380V	0	

Parameter	Explanation	Settings	Factory Setting	Customer
Group 1 Basic Parameters				
01.00	Maximum Output Frequency (Fmax)	50.00 to 600.0 Hz	60.00	
01.01	Maximum Voltage Frequency (Fbase)	0.10 to 600.0 Hz	60.00	
01.02	Maximum Output Voltage (Vmax)	115V/230V series: 0.1V to 255.0V 460V series: 0.1V to 510.0V	220.0 440.0	
01.03	Mid-Point Frequency (Fmid)	0.10 to 600.0 Hz	1.50	
01.04	Mid-Point Voltage (Vmid)	115V/230V series: 0.1V to 255.0V 460V series: 0.1V to 510.0V	10.0 20.0	
01.05	Minimum Output Frequency (Fmin)	0.10 to 600.0 Hz	1.50	
01.06	Minimum Output Voltage (Vmin)	115V/230V series: 0.1V to 255.0V 460V series: 0.1V to 510.0V	10.0 20.0	
01.07	Output Frequency Upper Limit	0.1 to 120.0%	110.0	
01.08	Output Frequency Lower Limit	0.0 to 100.0 %	0.0	
↗01.09	Accel Time 1	0.1 to 600.0 / 0.01 to 600.0 sec	10.0	
↗01.10	Decel Time 1	0.1 to 600.0 / 0.01 to 600.0 sec	10.0	
↗01.11	Accel Time 2	0.1 to 600.0 / 0.01 to 600.0 sec	10.0	
↗01.12	Decel Time 2	0.1 to 600.0 / 0.01 to 600.0 sec	10.0	
↗01.13	Jog Acceleration Time	0.1 to 600.0 / 0.01 to 600.0 sec	1.0	
↗01.14	Jog Deceleration Time	0.1 to 600.0 / 0.01 to 600.0 sec	1.0	
↗01.15	Jog Frequency	0.10 Hz to Fmax (Pr.01.00) Hz	6.00	
01.16	Auto acceleration / deceleration (refer to Accel/Decel time setting)	0: Linear Accel/Decel 1: Auto Accel, Linear Decel 2: Linear Accel, Auto Decel 3: Auto Accel/Decel (Set by load) 4: Auto Accel/Decel (set by Accel/Decel Time setting)	0	
01.17	Acceleration S-Curve	0.0 to 10.0 / 0.00 to 10.00 sec	0.0	
01.18	Deceleration S-Curve	0.0 to 10.0 / 0.00 to 10.00 sec	0.0	
01.19	Accel/Decel Time Unit	0: Unit: 0.1 sec 1: Unit: 0.01 sec	0	
Group 2 Operation Method Parameters				

Parameter	Explanation	Settings	Factory Setting	Customer
↗02.00	Source of First Master Frequency Command	0: Digital keypad UP/DOWN keys or Multi-function Inputs UP/DOWN. Last used frequency saved. 1: 0 to +10V from AVI 2: 4 to 20mA from ACI or 0 to +10V from AVI2 3: RS-485 serial communication (RJ-45). 4: Digital keypad potentiometer	1	
↗02.01	Source of First Operation Command	0: Digital keypad 1: External terminals. Keypad STOP/RESET enabled. 2: External terminals. Keypad STOP/RESET disabled. 3: RS-485 serial communication (RJ-45). Keypad STOP/RESET enabled. 4: RS-485 serial communication (RJ-45). Keypad STOP/RESET disabled.	1	
02.02	Stop Method	0: STOP: ramp to stop; E.F.: coast to stop 1: STOP: coast to stop; E.F.: coast to stop 2: STOP: ramp to stop; E.F.: ramp to stop 3: STOP: coast to stop; E.F.: ramp to stop	0	
02.03	PWM Carrier Frequency Selections	1 to 15kHz	8	
02.04	Motor Direction Control	0: Enable forward/reverse operation 1: Disable reverse operation 2: Disabled forward operation	0	
02.05	Line Start Lockout	0: Disable. Operation status is not changed even if operation command source Pr.02.01 is changed. 1: Enable. Operation status is not changed even if operation command source Pr.02.01 is changed. 2: Disable. Operation status will change if operation command source Pr.02.01 is changed. 3: Enable. Operation status will change if operation command source Pr.02.01 is changed.	1	
02.06	Loss of ACI Signal (4-20mA)	0: Decelerate to 0 Hz 1: Coast to stop and display "AErr" 2: Continue operation by last frequency command	1	
02.07	Up/Down Mode	0: by UP/DOWN Key 1: Based on accel/decel time 2: Constant speed 3: Pulse input unit	0	
02.08	Accel/Decel Rate of Change of UP/DOWN Operation with Constant Speed	0.01~10.00 Hz	0.01	

Parameter	Explanation	Settings	Factory Setting	Customer
↗02.09	Source of Second Frequency Command	0: Digital keypad UP/DOWN keys or Multi-function Inputs UP/DOWN. Last used frequency saved. 1: 0 to +10V from AVI 2: 4 to 20mA from ACI or 0 to +10V from AVI2 3: RS-485 serial communication (RJ-45). 4: Digital keypad potentiometer	0	
↗02.10	Combination of the First and Second Master Frequency Command	0: First Master Frequency Command 1: First Master Frequency Command+ Second Master Frequency Command 2: First Master Frequency Command - Second Master Frequency Command	0	
↗02.11	Keyboard Frequency Command	0.00 to 600.0Hz	60.00	
↗02.12	Communication Frequency Command	0.00 to 600.0Hz	60.00	
02.13	The Selections for Saving Keypad or Communication Frequency Command	0: Save Keypad & Communication Frequency 1: Save Keypad Frequency only 2: Save Communication Frequency only	0	
02.14	Frequency Command Selections at Stop (for Keypad and Communication)	0: by Current Freq Command 1: by Zero Freq Command 2: by Frequency Display at Stop	0	
02.15	Frequency Display at Stop	0.00 ~ 600.0Hz	60.00	
02.16	Display the Master Freq Command Source	Read Only Bit0=1: by First Freq Source (Pr.02.00). Bit1=1: by Second Freq Source (Pr.02.09). Bit2=1: by Multi-input function. Bit3=1: by PLC Freq command.	##	
02.17	Display the Operation Command Source	Read Only Bit0=1: by Digital Keypad. Bit1=1: by RS485 communication. Bit2=1: by External Terminal 2/3 wire mode. Bit3=1: by Multi-input function. Bit4=1: by PLC Operation Command.	##	
Group 3 Output Function Parameters				

Parameter	Explanation	Settings	Factory Setting	Customer
03.00	Multi-function Output Relay (RA1, RB1, RC1)	0: No function 1: AC drive operational 2: Master frequency attained 3: Zero speed 4: Over torque detection 5: Base-Block (B.B.) indication 6: Low-voltage indication 7: Operation mode indication 8: Fault indication 9: Desired frequency attained 10: Terminal count value attained 11: Preliminary count value attained 12: Over Voltage Stall supervision 13: Over Current Stall supervision 14: Heat sink overheat warning 15: Over Voltage supervision 16: PID supervision 17: Forward command 18: Reverse command 19: Zero speed output signal 20: Warning (FbE, Cexx, AoL2, AUE, SAvE) 21: Brake control (Desired frequency attained)	8	
03.01	Multi-function Output Terminal MO1	16: PID supervision 17: Forward command 18: Reverse command 19: Zero speed output signal 20: Warning (FbE, Cexx, AoL2, AUE, SAvE) 21: Brake control (Desired frequency attained)	1	
03.02	Desired Frequency Attained	0.00 to 600.0Hz	0.00	
↗03.03	Analog Output Signal	0: Analog frequency meter 1: Analog current meter	0	
↗03.04	Analog Output Gain	1 to 200%	100	
03.05	Terminal Count Value	0 to 9999	0	
03.06	Preliminary Count Value	0 to 9999	0	
03.07	EF Active When Terminal Count Value Attained	0: Terminal count value attained, no EF display 1: Terminal count value attained, EF active	0	
03.08	Fan Control	0: Fan always ON 1: 1 minute after AC motor drive stops, fan will be OFF 2: Fan ON when AC motor drive runs, fan OFF when AC motor drive stops 3: Fan ON when preliminary heatsink temperature attained	0	
03.09	The Digital Output Used by PLC	Read only Bit0=1:RLY used by PLC Bit1=1:MO1 used by PLC Bit2=1:MO2/RA2 used by PLC Bit3=1:MO3/RA3 used by PLC Bit4=1:MO4/RA4 used by PLC Bit5=1:MO5/RA5 used by PLC Bit6=1:MO6/RA6 used by PLC Bit7=1:MO7/RA7 used by PLC	##	

Parameter	Explanation	Settings	Factory Setting	Customer
03.10	The Analog Output Used by PLC	Read only Bit0=1:AFM used by PLC	##	
03.11	Brake Release Frequency	0.00 to 20.00Hz	0.00	
03.12	Brake Engage Frequency	0.00 to 20.00Hz	0.00	
03.13	Display the Status of Multi-function Output Terminals	Read only Bit0: RLY Status Bit1: MO1 Status Bit2: MO2/RA2 Status Bit3: MO3/RA3 Status Bit4: MO4/RA4 Status Bit5: MO5/RA5 Status Bit6: MO6/RA6 Status Bit7: MO7/RA7 Status	##	
Group 4 Input Function Parameters				
↗04.00	Keypad Potentiometer Bias	0.0 to 100.0 %	0.0	
↗04.01	Keypad Potentiometer Bias Polarity	0: Positive bias 1: Negative bias	00	
↗04.02	Keypad Potentiometer Gain	0.1 to 200.0 %	100.0	
04.03	Keypad Potentiometer Negative Bias, Reverse Motion Enable/Disable	0: No negative bias command 1: Negative bias: REV motion enabled	0	
04.04	2-wire/3-wire Operation Control Modes	0: 2-wire: FWD/STOP, REV/STOP 1: 2-wire: FWD/REV, RUN/STOP 2: 3-wire operation	0	
04.05	Multi-function Input Terminal (MI3)	0: No function 1: Multi-Step speed command 1 2: Multi-Step speed command 2 3: Multi-Step speed command 3	1	
04.06	Multi-function Input Terminal (MI4)	4: Multi-Step speed command 4 5: External reset 6: Accel/Decel inhibit 7: Accel/Decel time selection command	2	
04.07	Multi-function Input Terminal (MI5)	8: Jog Operation 9: External base block 10: Up: Increment master frequency 11: Down: Decrement master frequency	3	

Parameter	Explanation	Settings	Factory Setting	Customer
04.08	Multi-function Input Terminal (MI6)	12: Counter Trigger Signal 13: Counter reset 14: E.F. External Fault Input 15: PID function disabled 16: Output shutoff stop 17: Parameter lock enable 18: Operation command selection (external terminals) 19: Operation command selection (keypad) 20: Operation command selection (communication) 21: FWD/REV command 22: Source of second frequency command 23: Run/Stop PLC Program (PLC1) 24: Download/execute/monitor PLC Program (PLC2)	4	
04.09	Multi-function Input Contact Selection	Bit0: MI1 Bit1: MI2 Bit2: MI3 Bit3: MI4 Bit4: MI5 Bit5: MI6 Bit6: MI7 Bit7: MI8 Bit8: MI9 Bit9: MI10 Bit10: MI11 Bit11: MI12 0:N.O., 1:N.C. P.S.: MI1 to MI3 will be invalid when it is 3-wire control.	0	
04.10	Digital Terminal Input Debouncing Time	1 to 20 (*2ms)	1	
04.11	Min. AVI Voltage	0.0 to 10.0V	0.0	
04.12	Min AVI Frequency	0.0 to 100.0%	0.0	
04.13	Max AVI Voltage	0.0 to 10.0V	10.0	
04.14	Max AVI Frequency	0.0 to 100.0%	100.0	
04.15	Min ACI Voltage	0.0 to 20.0mA	4.0	
04.16	Min ACI Frequency	0.0 to 100.0%	0.0	
04.17	Min ACI Voltage	0.0 to 20.0mA	20.0	
04.18	Max ACI Frequency	0.0 to 100.0%	100.0	
04.19	ACI/AVI2 Selection	0: ACI 1: AVI2	0	
04.20	Min AVI2 Voltage	0.0 to 10.0V	0.0	
04.21	Min AVI2 Frequency	0.0 to 100.0%	0.0	
04.22	Max AVI2 Voltage	0.0 to 10.0V	10.0	
04.23	Max AVI2 Frequency	0.0 to 100.0%	100.0	

Parameter	Explanation	Settings	Factory Setting	Customer
04.24	The Digital Input Used by PLC	Read only. Bit0=1:MI1 used by PLC Bit1=1:MI2 used by PLC Bit2=1:MI3 used by PLC Bit3=1:MI4 used by PLC Bit4=1:MI5 used by PLC Bit5=1:MI6 used by PLC Bit6=1: MI7 used by PLC Bit7=1: MI8 used by PLC Bit8=1: MI9 used by PLC Bit9=1: MI10 used by PLC Bit10=1: MI11 used by PLC Bit11=1: MI12 used by PLC	##	
04.25	The Analog Input Used by PLC	Read only. Bit0=1:AVI used by PLC Bit1=1:ACI/AVI2 used by PLC	##	
04.26	Display the Status of Multi-function Input Terminal	Read only. Bit0: MI1 Status Bit1: MI2 Status Bit2: MI3 Status Bit3: MI4 Status Bit4: MI5 Status Bit5: MI6 Status Bit6: MI7 Status Bit7: MI8 Status Bit8: MI9 Status Bit9: MI10 Status Bit10: MI11 Status Bit11: MI12 Status	##	
04.27	Internal/External Multi-function Input Terminals Selection	0~4095	0	
04.28	Internal Terminal Status	0~4095	0	
Group 5 Multi-Step Speed and PLC Parameters				
↗05.00	1st Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.01	2nd Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.02	3rd Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.03	4th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.04	5th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.05	6th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.06	7th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.07	8th Step Speed Frequency	0.00 to 600.0 Hz	0.00	

Parameter	Explanation	Settings	Factory Setting	Customer
↗05.08	9th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.09	10th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.10	11th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.11	12th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.12	13th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.13	14th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
↗05.14	15th Step Speed Frequency	0.00 to 600.0 Hz	0.00	
Group 6 Protection Parameters				
06.00	Over-Voltage Stall Prevention	115/230V series: 330.0V to 410.0V 460V series: 660.0V to 820.0V 0.0: Disable over-voltage stall prevention	390.0V 780.0V	
06.01	Over-Current Stall Prevention during Accel	0:Disable 20 to 250%	170	
06.02	Over-Current Stall Prevention during Operation	0:Disable 20 to 250%	170	
06.03	Over-Torque Detection Mode (OL2)	0: Disabled 1: Enabled during constant speed operation. After the over-torque is detected, keep running until OL1 or OL occurs. 2: Enabled during constant speed operation. After the over-torque is detected, stop running. 3: Enabled during accel. After the over-torque is detected, keep running until OL1 or OL occurs. 4: Enabled during accel. After the over-torque is detected, stop running.	0	
06.04	Over-Torque Detection Level	10 to 200%	150	
06.05	Over-Torque Detection Time	0.1 to 60.0 sec	0.1	
06.06	Electronic Thermal Overload Relay Selection	0: Standard motor (self cooled by fan) 1: Special motor (forced external cooling) 2: Disabled	2	
06.07	Electronic Thermal Characteristic	30 to 600 sec	60	

Parameter	Explanation	Settings	Factory Setting	Customer
06.08	Present Fault Record	0: No fault 1: Over current (oc) 2: Over voltage (ov) 3: IGBT Overheat (oH1) 4: Power Board Overheat (oH2) 5: Overload (oL) 6: Overload1 (oL1) 7: Motor over load (oL2) 8: External fault (EF) 9: Current exceeds 2 times rated current during accel.(ocA)	0	
06.09	Second Most Recent Fault Record	10: Current exceeds 2 times rated current during decel.(ocd) 11: Current exceeds 2 times rated current during steady state operation (ocn) 12: Ground fault (GFF) 13: Reserved 14: Phase-Loss (PHL) 15: Reserved 16: Auto Accl/Decel failure (CFA) 17: SW/Password protection (codE) 18: Power Board CPU WRITE failure (cF1.0) 19: Power Board CPU READ failure (cF2.0) 20: CC, OC Hardware protection failure (HPF1)		
06.10	Third Most Recent Fault Record	21: OV Hardware protection failure (HPF2) 22: GFF Hardware protection failure (HPF3) 23: OC Hardware protection failure (HPF4) 24: U-phase error (cF3.0)		
06.11	Fourth Most Recent Fault Record	25: V-phase error (cF3.1) 26: W-phase error (cF3.2) 27: DCBUS error (cF3.3) 28: IGBT Overheat (cF3.4) 29: Power Board Overheat (cF3.5) 30: Control Board CPU WRITE failure (cF1.1) 31: Control Board CPU WRITE failure (cF2.1)		
06.12	Fifth Most Recent Fault Record	32: ACI signal error (AErr) 33: Reserved 34: Motor PTC overheat protection (PtC1) 35-39: Reserved 40: Communication time-out error of control board and power board (CP10)		
Group 7 Motor Parameters				
↗07.00	Motor Rated Current	30 %FLA to 120% FLA	100	
↗07.01	Motor No-Load Current	0%FLA to 99% FLA	40	
↗07.02	Torque Compensation	0.0 to 10.0	0.0	
↗07.03	Slip Compensation (Used without PG)	0.00 to 10.00	0.00	
07.04	Motor Parameters Auto Tuning	0: Disable 1: Auto tuning R1 2: Auto tuning R1 + no-load test	0	

Parameter	Explanation	Settings	Factory Setting	Customer
07.05	Motor Line-to-line Resistance R1	0~65535 mΩ	0	
07.06	Motor Rated Slip	0.00 to 20.00 Hz	3.00	
07.07	Slip Compensation Limit	0 to 250%	200	
07.08	Torque Compensation Time Constant	0.01 ~10.00 Sec	0.10	
07.09	Slip Compensation Time Constant	0.05 ~10.00 sec	0.20	
07.10	Accumulative Motor Operation Time (Min.)	0 to 1439 Min.	0	
07.11	Accumulative Motor Operation Time (Day)	0 to 65535 Day	0	
07.12	Motor PTC Overheat Protection	0: Disable 1: Enable	0	
07.13	Input Debouncing Time of the PTC Protection	0~9999(*2ms)	100	
07.14	Motor PTC Overheat Protection Level	0.1~10.0V	2.4	
07.15	Motor PTC Overheat Warning Level	0.1~10.0V	1.2	
07.16	Motor PTC Overheat Reset Delta Level	0.1~5.0V	0.6	
07.17	Treatment of the Motor PTC Overheat	0: Warn and RAMP to stop 1: Warn and COAST to stop 2: Warn and keep running	0	
Group 8 Special Parameters				
08.00	DC Braking Current Level	0 to 100%	0	
08.01	DC Braking Time during Start-Up	0.0 to 60.0 sec	0.0	
08.02	DC Braking Time during Stopping	0.0 to 60.0 sec	0.0	
08.03	Start-Point for DC Braking	0.00 to 600.0Hz	0.00	
08.04	Momentary Power Loss Operation Selection	0: Operation stops after momentary power loss 1: Operation continues after momentary power loss, speed search starts with the Master Frequency reference value 2: Operation continues after momentary power loss, speed search starts with the minimum frequency	0	
08.05	Maximum Allowable Power Loss Time	0.1 to 5.0 sec	2.0	
08.06	Base-block Speed Search	0: Disable speed search 1: Speed search starts with last frequency command 2: Starts with minimum output frequency	1	

Parameter	Explanation	Settings	Factory Setting	Customer
08.07	B.B. Time for Speed Search	0.1 to 5.0 sec	0.5	
08.08	Current Limit for Speed Search	30 to 200%	150	
08.09	Skip Frequency 1 Upper Limit	0.00 to 600.0 Hz	0.00	
08.10	Skip Frequency 1 Lower Limit	0.00 to 600.0 Hz	0.00	
08.11	Skip Frequency 2 Upper Limit	0.00 to 600.0 Hz	0.00	
08.12	Skip Frequency 2 Lower Limit	0.00 to 600.0 Hz	0.00	
08.13	Skip Frequency 3 Upper Limit	0.00 to 600.0 Hz	0.00	
08.14	Skip Frequency 3 Lower Limit	0.00 to 600.0 Hz	0.00	
08.15	Auto Restart After Fault	0 to 10 (0=disable)	0	
08.16	Auto Reset Time at Restart after Fault	0.1 to 6000 sec	60.0	
08.17	Auto Energy Saving	0: Disable 1: Enable	0	
08.18	AVR Function	0: AVR function enable 1: AVR function disable 2: AVR function disable for decel. 3: AVR function disable for stop	0	
08.19	Software Braking Level	115V / 230V series: 370.0to 430.0V 460V series: 740.0 to 860.0V	380.0 760.0	
↗08.20	Compensation Coefficient for Motor Instability	0.0~5.0	0.0	
Group 9 Communication Parameters				
09.00	Communication Address	1 to 254	1	
09.01	Transmission Speed	0: Baud rate 4800bps 1: Baud rate 9600bps 2: Baud rate 19200bps 3: Baud rate 38400bps	1	
09.02	Transmission Fault Treatment	0: Warn and keep operating 1: Warn and ramp to stop 2: Warn and coast to stop 3: No warning and keep operating	3	
09.03	Time-out Detection	0.1 ~ 120.0 seconds 0.0: Disable	0.0	
09.04	Communication Protocol	0: 7,N,2 (Modbus, ASCII) 1: 7,E,1 (Modbus, ASCII) 2: 7,O,1 (Modbus, ASCII) 3: 8,N,2 (Modbus, RTU) 4: 8,E,1 (Modbus, RTU) 5: 8,O,1 (Modbus, RTU)	0	

Parameter	Explanation	Settings	Factory Setting	Customer
09.05	Reserved			
09.06	Reserved			
09.07	Response Delay Time	0 ~ 200 (unit: 2ms)	1	
Group 10 PID Control Parameters				
10.00	PID Set Point Selection	0: Disable PID operation 1: Keypad (based on Pr.02.00) 2: 0 to +10V from AVI 3: 4 to 20mA from ACI or 0 to +10V from AVI2 4: PID set point (Pr.10.11)	0	
10.01	Input Terminal for PID Feedback	1: Positive PID feedback from external terminal AVI (0 ~ +10VDC) 2: Negative PID feedback from external terminal AVI (0 ~ +10VDC) 3: Positive PID feedback from external terminal ACI (4 ~ 20mA)/ AVI2 (0 ~ +10VDC). 4: Negative PID feedback from external terminal ACI (4 ~ 20mA)/ AVI2 (0 ~ +10VDC).	0	
↗10.02	Proportional Gain (P)	0.0 to 10.0	1.0	
↗10.03	Integral Time (I)	0.00 to 100.0 sec (0.00=disable)	1.00	
↗10.04	Derivative Control (D)	0.00 to 1.00 sec	0.00	
10.05	Upper Bound for Integral Control	0 to 100%	100	
10.06	Primary Delay Filter Time	0.0 to 2.5 sec	0.0	
10.07	PID Output Freq Limit	0 to 110%	100	
10.08	PID Feedback Signal Detection Time	0.0 to 3600 sec (0.0 disable)	60.0	
10.09	Treatment of the Erroneous PID Feedback Signals	0: Warn and RAMP to stop 1: Warn and COAST to stop 2: Warn and keep operation	0	
10.10	Gain Over the PID Detection Value	0.0 to 10.0	1.0	
↗10.11	Source of PID Set point	0.00 to 600.0Hz	0.00	
10.12	PID Offset Level	1.0 to 50.0%	10.0	
10.13	Detection Time of PID Offset	0.1 to 300.0 sec	5.0	
10.14	Sleep/Wake Up Detection Time	0.0 to 6550 sec	0.0	
10.15	Sleep Frequency	0.00 to 600.0 Hz	0.00	
10.16	Wakeup Frequency	0.00 to 600.0 Hz	0.00	

Parameter	Explanation	Settings	Factory Setting	Customer
10.17	Minimum PID Output Frequency Selection	0: By PID control 1: By minimum output frequency (Pr.01.05)	0	
Group 11 Parameters for Extension Card				
11.00	Multi-function Output Terminal MO2/RA2	0: No function 1: AC drive operational 2: Master frequency attained 3: Zero speed	0	
11.01	Multi-function Output Terminal MO3/RA3	4: Over torque detection 5: Base-Block (B.B.) indication 6: Low-voltage indication 7: Operation mode indication	0	
11.02	Multi-function Output Terminal MO4/RA4	8: Fault indication 9: Desired frequency attained 10: Terminal count value attained	0	
11.03	Multi-function Output Terminal MO5/RA5	11: Preliminary count value attained 12: Over Voltage Stall supervision 13: Over Current Stall supervision 14: Heat sink overheat warning	0	
11.04	Multi-function Output Terminal MO6/RA6	15: Over Voltage supervision 16: PID supervision 17: Forward command 18: Reverse command	0	
11.05	Multi-function Output Terminal MO7/RA7	19: Zero speed output signal 20: Warning(FbE,Cexx, AoL2, AUE, SAvE) 21: Brake control (Desired frequency attained)	0	
11.06	Multi-function Input Terminal (MI7)	0: No function 1: Multi-Step speed command 1 2: Multi-Step speed command 2 3: Multi-Step speed command 3 4: Multi-Step speed command 4	0	
11.07	Multi-function Input Terminal (MI8)	5: External reset 6: Accel/Decel inhibit 7: Accel/Decel time selection command 8: Jog Operation	0	
11.08	Multi-function Input Terminal (MI9)	9: External base block 10: Up: Increment master frequency 11: Down: Decrement master frequency	0	
11.09	Multi-function Input Terminal (MI10)	12: Counter Trigger Signal 13: Counter reset 14: E.F. External Fault Input	0	
11.10	Multi-function Input Terminal (MI11)	15: PID function disabled 16: Output shutoff stop 17: Parameter lock enable 18: Operation command selection (external	0	

Parameter	Explanation	Settings	Factory Setting	Customer
11.11	Multi-function Input Terminal (MI12)	terminals) 19: Operation command selection (keypad) 20: Operation command selection (communication) 21: FWD/REV command 22: Source of second frequency command 23: Run/Stop PLC Program (PLC1) 24: Download/execute/monitor PLC Program (PLC2)	0	

Fault Codes

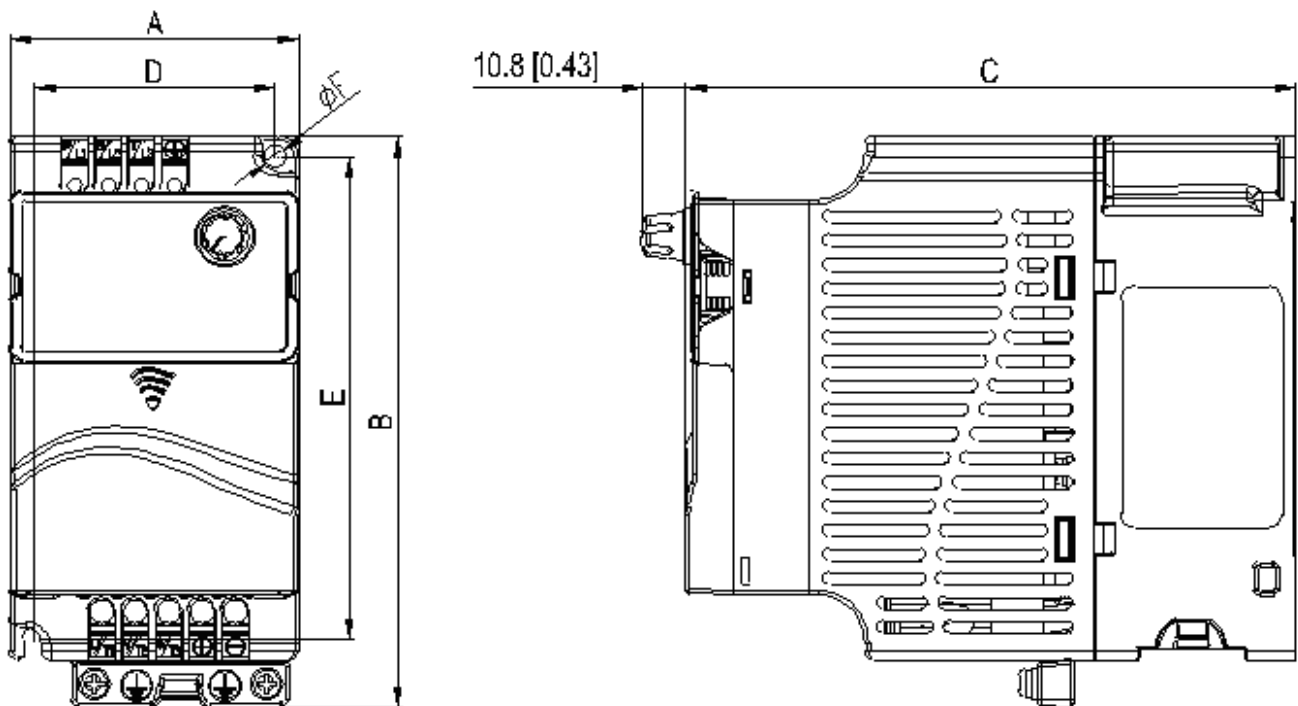
Fault Name	Fault Descriptions	Corrective Actions
OC	Over current Abnormal increase in current.	<ol style="list-style-type: none"> 1. Check if motor power corresponds with the AC motor drive output power. 2. Check the wiring connections to U/T1, V/T2, W/T3 for possible short circuits. 3. Check the wiring connections between the AC motor drive and motor for possible short circuits, also to ground. 4. Check for loose contacts between AC motor drive and motor. 5. Increase the Acceleration Time. 6. Check for possible excessive loading conditions at the motor. 7. If there are still any abnormal conditions when operating the AC motor drive after a short-circuit is removed and the other points above are checked, it should be sent back to manufacturer.
OU	Over voltage The DC bus voltage has exceeded its maximum allowable value.	<ol style="list-style-type: none"> 1. Check if the input voltage falls within the rated AC motor drive input voltage range. 2. Check for possible voltage transients. 3. DC-bus over-voltage may also be caused by motor regeneration. Either increase the Decel. Time or add an optional brake resistor (and brake unit). 4. Check whether the required braking power is within the specified limits.
OH1 OH2	Overheating Heat sink temperature too high	<ol style="list-style-type: none"> 1. Ensure that the ambient temperature falls within the specified temperature range. 2. Make sure that the ventilation holes are not obstructed. 3. Remove any foreign objects from the heatsinks and check for possible dirty heat sink fins. 4. Check the fan and clean it. 5. Provide enough spacing for adequate ventilation.

Fault Name	Fault Descriptions	Corrective Actions
<i>Lu</i>	Low voltage The AC motor drive detects that the DC bus voltage has fallen below its minimum value.	<ol style="list-style-type: none"> 1. Check whether the input voltage falls within the AC motor drive rated input voltage range. 2. Check whether the motor has sudden load. 3. Check for correct wiring of input power to R-S-T (for 3-phase models) without phase loss.
<i>ol</i>	Overload The AC motor drive detects excessive drive output current. NOTE: The AC motor drive can withstand up to 150% of the rated current for a maximum of 60 seconds.	<ol style="list-style-type: none"> 1. Check whether the motor is overloaded. 2. Reduce torque compensation setting in Pr.07.02. 3. Take the next higher power AC motor drive model.
<i>ol1</i>	Overload 1 Internal electronic overload trip	<ol style="list-style-type: none"> 1. Check for possible motor overload. 2. Check electronic thermal overload setting. 3. Use a higher power motor. 4. Reduce the current level so that the drive output current does not exceed the value set by the Motor Rated Current Pr.07.00.
<i>ol2</i>	Overload 2 Motor overload.	<ol style="list-style-type: none"> 1. Reduce the motor load. 2. Adjust the over-torque detection setting to an appropriate setting (Pr.06.03 to Pr.06.05).
<i>HPF1</i>	CC (current clamp)	Return to the factory.
<i>HPF2</i>	OV hardware error	
<i>HPF3</i>	GFF hardware error	
<i>HPF4</i>	OC hardware error	
<i>bb</i>	External Base Block. (Refer to Pr. 08.07)	<ol style="list-style-type: none"> 1. When the external input terminal (B.B) is active, the AC motor drive output will be turned off. 2. Deactivate the external input terminal (B.B) to operate the AC motor drive again.
<i>ocA</i>	Over-current during acceleration	<ol style="list-style-type: none"> 1. Short-circuit at motor output: Check for possible poor insulation at the output lines. 2. Torque boost too high: Decrease the torque compensation setting in Pr.07.02. 3. Acceleration Time too short: Increase the Acceleration Time. 4. AC motor drive output power is too small: Replace the AC motor drive with the next higher power model.
<i>ocd</i>	Over-current during deceleration	<ol style="list-style-type: none"> 1. Short-circuit at motor output: Check for possible poor insulation at the output line. 2. Deceleration Time too short: Increase the Deceleration Time. 3. AC motor drive output power is too small: Replace the AC motor drive with the next higher power model.

Fault Name	Fault Descriptions	Corrective Actions
OCN	Over-current during steady state operation	<ol style="list-style-type: none"> 1. Short-circuit at motor output: Check for possible poor insulation at the output line. 2. Sudden increase in motor loading: Check for possible motor stall. 3. AC motor drive output power is too small: Replace the AC motor drive with the next higher power model.
EF	External Fault	<ol style="list-style-type: none"> 1. When multi-function input terminals (MI3-MI9) are set to external fault, the AC motor drive stops output U, V and W. 2. Give RESET command after fault has been cleared.
cF10	Internal EEPROM can not be programmed.	Return to the factory.
cF11	Internal EEPROM can not be programmed.	Return to the factory.
cF20	Internal EEPROM can not be read.	<ol style="list-style-type: none"> 1. Press RESET key to set all parameters to factory setting. 2. Return to the factory.
cF21	Internal EEPROM can not be read.	<ol style="list-style-type: none"> 1. Press RESET key to set all parameters to factory setting. 2. Return to the factory.
cF30	U-phase error	Return to the factory.
cF31	V-phase error	
cF32	W-phase error	
cF33	OV or LV	
cF34	Temp. sensor error	
cF35		
OFF	Ground fault	<p>When (one of) the output terminal(s) is grounded, short circuit current is more than 50% of AC motor drive rated current, the AC motor drive power module may be damaged.</p> <p>NOTE: The short circuit protection is provided for AC motor drive protection, not for protection of the user.</p> <ol style="list-style-type: none"> 1. Check whether the IGBT power module is damaged. 2. Check for possible poor insulation at the output line.
cFR	Auto accel/decel failure	<ol style="list-style-type: none"> 1. Check if the motor is suitable for operation by AC motor drive. 2. Check if the regenerative energy is too large. 3. Load may have changed suddenly.
cE--	Communication Error	<ol style="list-style-type: none"> 1. Check the RS485 connection between the AC motor drive and RS485 master for loose wires and wiring to correct pins. 2. Check if the communication protocol, address, transmission speed, etc. are properly set. 3. Use the correct checksum calculation. 4. Please refer to group 9 in the chapter 5 for detail information.

Fault Name	Fault Descriptions	Corrective Actions
<i>code</i>	Software protection failure	Return to the factory.
<i>RErr</i>	Analog signal error	Check the wiring of ACI
<i>FbE</i>	PID feedback signal error	<ol style="list-style-type: none"> 1. Check parameter settings (Pr.10.01) and AVI/ACI wiring. 2. Check for possible fault between system response time and the PID feedback signal detection time (Pr.10.08)
<i>PHL</i>	Phase Loss	Check Power Source Input if all 3 input phases are connected without loose contacts.
<i>RUE</i>	Auto Tuning Error	<ol style="list-style-type: none"> 1. Check cabling between drive and motor 2. Retry again

Dimensions are in mm [inch]



Model Name PDC-	A	B	C	D	E	F
11/12/32.002-A, 11/12/32/34.004-A, 12/32/34.007-A, 32/34.015-A	72.0 [2.83]	142.0 [5.59]	152.0 [5.98]	60.0 [2.36]	120.0 [4.72]	5.2 [0.20]
11.007-A, 12.015-A, 12/32/34.022-A, 32/34.037-A	100.0 [3.94]	174.0 [6.86]	152.0 [5.98]	89.0 [3.51]	162.0 [6.38]	5.5 [0.22]
32/34.055-A, 32/34.075-A 34.110-A	130.0 [5.12]	260.0 [10.24]	169.2 [6.67]	116.0 [4.57]	246.5 [9.71]	5.5 [0.22]

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- Kalkmilch-Mischanlagen
- Schlamm-Kalk-Behandlungsanlagen
- Mörtel-Beschichtungsanlagen
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