


Title	Component list for electrics		
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D	07/16/2020	Benjamin Pelicione	Christian Kern	part no. adapted, ET200S changed to ET200SP, other Siemens adjusted, E+H adjusted
E	26/01/2021	Martin Pohli	Christian Kern	Change Turck to IFM actuators, change FHF EV21->EV24

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General specifications

Signal and control voltage	24VDC
Analog IO signals	4-20mA
Motor electrical parameters:	
Preferred motor winding	230/400V - Delta/Star
Base frequency	50 Hz
External fan	400VAC
Brake voltage	24VDC

Incoming feeder cubicle and main switch**Main switch 3VA for line and motor protection - made by Siemens**

Main switch 250 A, mech, ETU850 (100-250A)	3VA2225-5KP32-0AA0
Main switch 400 A, mech, ETU850 (160-400A)	3VA2340-5KP32-0AA0
Main switch 630 A, mech, ETU850 (250-630A)	3VA2463-5KP32-0AA0
Main switch 800 A, mech, ETU860 (320-800A)	3VA2580-5KQ32-0AA0
Main switch 1000 A, mech, ETU860 (400-1000A)	3VA2510-5KQ32-0AA0
Main switch 1250 A, mech, ETU650 (1250A)	3VA2712-1CE05-0AA0-Z (F11+K50+K51+K53)

Main switch 3VA, accessories

3VA2 250 Terminal Cover short	3VA9123-0KB01
3VA2 250 Terminal Cover long	3VA9221-0WF30
3VA2 250 Communication Module COM060	3VA9187-0TB10
3VA2 250 Wire Connector 2x150mm ² with aux-cond. voltage tap	3VA9223-0JC22
3VA2 400/630 Terminal Cover short	3VA9353-0KB01
3VA2 400/630 Terminal Cover long	3VA9481-0WF30
3VA2 400/630 Wire Connector 2x300mm ² with aux-cond. voltage tap	3VA9403-0JC23
3VA2 800/1000 Terminal Cover short	3VA9601-0WD30
3VA2 800 Wire Connector 2x300mm ² with aux-cond. voltage tap	3VA9503-0JG23
3VA2 800/1000 Self-made wire connector for 3 or more cond. per phase	self-made
3VA2 800/1000 Connection bar extension for self-made wire connector	3VA9603-0QB00
3VA2 400-1000 Communication Module COM060	3VA9387-0TB10
3VA2 400-1000 Connection Cable 3VA-line	3VA9987-0TC30
3VA2 400-1000 Data Server COM100	3VA9987-0TA20
3VA2 400-1000 PROFINET Expansion Module for COM100	7KM9300-0AE01-0AA0
3VA2 1250 Front Terminal Cover	3VW9723-0WF30
3VA2 1250 Communication Module COM043	(+F11)
3VA2 1250 ready to switch indicator	(+K50)
3VA2 1250 auxiliary circuit breaker	(+K51)
3VA2 1250 tripped indicator	(+K53)

Door operators for cabinets or other accessories if necessary in coordination with KE

Main switch general, front / floor installation

Main switch 16 A, 3-pole, front-mounted, bk/gy	3LD2 003-0TK51
Main switch 16 A, 3-pole, front-mounted, ye/rd (emergency stop)	3LD2 003-0TK53
Main switch 25 A, 3-pole, front-mounted, bk/gy	3LD2 103-0TK51
Main switch 25 A, 3-pole, front-mounted, ye/rd (emergency stop)	3LD2 103-0TK53
Main switch 63 A, 3-pole, front-mounted, bk/gy	3LD2 504-0TK51
Main switch 63 A, 3-pole, front-mounted, ye/rd (emergency stop)	3LD2 504-0TK53
Main switch 63 A, 3-pole, floor mounting, bk/gy	3LD2 514-0TK51
Main switch 63 A, 3-pole, floor mounting, ye/rd (emergency stop)	3LD2 514-0TK53
Main switch 125 A, 3-pole, front-mounted, bk/gy	3LD2 804-0TK51
Main switch 125 A, 3-pole, front-mounted, ye/rd (emergency stop)	3LD2 804-0TK53
Main switch 125 A, 3-pole, floor mounting, bk/gy	3LD2 814-0TK51
Main switch 125 A, 3-pole, floor mounting, ye/rd (emergency stop)	3LD2 814-0TK53
Auxiliary switch for 3LD2	3LD9 200-5B

Overvoltage protection for RiLine60 busbar, made by Phönix

Type VAL –CP-MOSO 60-3C-FM, 4 - conductor (standard)	2804416
Type VAL –CP-MOSO 60-3S-FM, 5 - conductor	2804403

Busbar systems**Busbar system type RiLine60, 3-pole up to 800/1600 A – made by Rittal**

NH fuse-switch-disconnectors, size 000 with EFM and LED, 100 A, Cable outlet: bottom			SV 3431.035
NH fuse-switch-disconnectors, size 00 with EFM and LED, 160 A Cable outlet: top/bottom			SV 9343.020
NH fuse-switch-disconnectors, size 01 with EFM and LED, 250 A Cable outlet: top/bottom			SV 9343.120
NH fuse-switch-disconnectors, size 02 with EFM and LED, 400 A Cable outlet: top/bottom			SV 9343.230
Box terminal for NH fuse-switch-disconnectors 95-300mm ²			SV 9344.620
NH fuse-switch-disconnectors, size 03 with EFM and LED, 630 A Cable outlet: top/bottom			SV 9343.330
Box terminal for NH fuse-switch-disconnectors 95-300mm ²			SV 9344.620
Micro-switch for all NH disconnectors			
Size 000 / 00	(P.Unit 5)		SV 3071.000
Size 1/ 2/ 3 + adapter	(P.Unit 2)		SV 9344.510
Component adapter 65 A, 55x272mm, with 2 support rails			SV 9340.450
With side extension if necessary			SV 9340.290
Connection adapter			
- up to 63 A outlet top	3-pole		SV 9342.200
- up to 63 A outlet bottom	3-pole		SV 9342.210
- up to 125 A outlet bottom / top	3-pole		SV 9342.220
- up to 125 A outlet bottom	3-pole		SV 9342.240
- up to 250 A outlet bottom / top	3-pole		SV 9342.250
- up to 800 A outlet bottom / top	3-pole		SV 9342.280
- up to 800 A outlet bottom / top	3x1-pole		SV 9342.310
- up to 1600 A outlet bottom / top	3x1-pole		SV 9342.320
Busbar support			
800 A	(P.Unit 4)		SV 9341.000
1600 A	(P.Unit 4)		SV 9342.000

Busbar system Type RiLine Compact, 3-pole up to 125 A – made by Rittal

Board with integral busbars, 225mm, 125 A	SV9635.000
Board with integral busbars, 405mm, 125 A	SV9635.010
Connection adapter, max 80A, cable outlet: bottom/top, 3-pole	SV9635.200
Connection adapter, max 125A, cable outlet: bottom/top, 3-pole	SV9635.210
Component adapter 25A, 45mm, 1 support rail AWG12 (=4mm ²)	SV9635.340
Component adapter 45A, 45mm, 1 support rail AWG8 (=10mm ²)	SV9635.360
NH fuse-switch-disconnectors, size 000, 125A	SV 9635.700
Motor controller up to 0.6 A, direct / reversing starters, over-ride protection + emergency stop	SV9635.400
Motor controller up to 3.0 A, direct / reversing starters, over-ride protection + emergency stop	SV9635.415
Motor controller up to 9.0 A, direct / reversing starters, over-ride protection + emergency stop	SV9635.425
Electronic power switch 25A, for fuses D=10mm, L=38mm	SV9635.500
Electronic power switch 25A, for fuses type: CC	SV9635.510

Control cabinet with accessories**Control cabinets with mounting plate – made by Rittal VX25****RAL 7035**

Cabinet Width (W) 600, Height (H) 2000, Depth (D) 600		VX 8606.000
Cabinet W 800, H 2000, D 600		VX 8806.000
Cabinet W 1200, H 2000, D 600		VX 8206.000
Base corner piece with trim panels H100 W600, solid	(P.Unit 2)	VX 8640.002
Base corner piece with trim panels H100 W800, solid	(P.Unit 2)	VX 8640.003
Base corner piece with trim panels H100 W1200, solid	(P.Unit 2)	VX 8640.007
Base trim panels, side D600, solid	(P.Unit 2)	VX 8640.033
Base with H200 or other accessories if necessary in coordination with KE		
Side panel H 2000, D 600		VX 8106.245
Internal divider panel H2000, T600		VX 8609.205

Control cabinet – standard accessories per cabinet

LED – cabinet light 11W 100-240VAC, 437mm for all cabinets		SZ2500.210
Door-operated switch with connection wire, 600 mm		SZ2500.460
Connection cable for supply, 3-pole, 3000 mm		SZ2500.400
Through-wiring, 3-pole, connector/ jack, 1000 mm		SZ2500.430
LED – cabinet light 10-LED 24VDC length 230 mm for desks		SZ 4140.810
LED – cabinet light 40-LED 24VDC length 530 mm for sub-distributor		SZ 4140.840
with magnetic mounting kit for LED-cabinet light		SZ 4140.000
with feeder cable 3000/600mm incl. switch for LED cabinet light		SZ 4315.810
Cable entry plates cabinet	width 600 mm	VX 8619.800
	width 800 mm	VX 8619.801
	width 1200 mm	VX 8619.803
Cable-entry grommets (10 pcs)	1 pcs. universal, divided	PS 4311.000
(25 pcs)	8 pcs./13mm	PS 4316.000
	3 pcs./21mm	PS 4317.000
	1 pcs./47mm	PS 4318.000
180° Hinges	(P.Unit 4)	VX 8618.330
Lock system comfort handle consisting of:		
Handle system		VX 8618.250
Lock-insert 3524 E		SZ 2467.000
Baying block, internal	(P.Unit 6)	VX 8617.501
Quick-fit baying clamps	(P.Unit 6).	VX 8617.506
Baying cover, top		TS 8800.865

Air conditioning

Choice and decision after consultation – made by Rittal
all devices for installation in / at the door or sidewall of the cabinet

Air / Air heat exchanger (Cabinet installation in the control room)

Flat heat exchanger 45 W/K (675W at temp. diff. of 15°C) SK 3128.100
Dimensions: W 400, H 950, D 205, mounting depth 155

Flat heat exchanger 90 W/K (1350W at temp. diff. of 15°C) SK 3130.100
Dimensions: W 400, H 1580, D 215, mounting depth 165

Air / Air cooling unit (Cabinet installation on site)

Blue e+ / Comfort controller, 400VAC – 3Ph SK 3186.930
Effective cooling capacity 2000W (35/35), 1290W (35/50)
Dimensions: W 450, H 1600, D 290, mounting depth 231 (for partial installation 115)

Blue e+ / Comfort controller, 400VAC – 3Ph SK 3187.930
Effective cooling capacity 2600W (35/35), 1820W (35/50)
Dimensions: W 450, H 1600, D 290, mounting depth 231 (for partial installation 115)

Blue e+ / Comfort controller, 400VAC – 3Ph SK 3188.940
Effective cooling capacity 4200W (35/35), 3020W (35/50)
Dimensions: W 450, H 1600, D 395, mounting depth for partial installation 140

Blue e+ / Comfort controller, 400VAC – 3Ph SK 3189.940
Effective cooling capacity 5800W (35/35), 4200W (35/50)
Dimensions: W 450, H 1600, D 395, mounting depth for partial installation 140

Filter mats for extreme conditions (3UoS) SK 3285.900
Metal filter for dusty and oily environments (1UoS) SK 3285.910
IoT Interface SK 3124.300

Mini cooling unit (as required for PC desks and sub-distributors)

TOP-THERM / basic controller, 230VAC – 1Ph SK 3302.100
Effective cooling capacity 300W (35/35), 150W (35/50)
Dimensions: W 280, H 550, D 140, mounting depth 98

Preferred device:

Thermoelectric cooler, 100-240VAC – 1Ph, effective cooling capacity 100W SK 3201.200
Dimensions: W 125, H 400, D 155, mounting depth 100

Air/water heat exchanger for burner cabinets (surrounding temp. >50°C)

Heat exchanger wall-mounted (300W -200l/h L40W15 temp.diff. 25°C) SK 3212.230
Dimensions: W 150, H 300, D 85 (no partial installation possible)

Sub-distributors, cable entry for UV and PC panels

Sub-distributors / panels – made by Rittal

Compact - control cabinets	Width	Height	Depth	
	150	150	120	KX 1500.000
	300	300	120	KX 1555.000
	380	300	210	AX 1031.000
	300	400	210	AX 1034.000
	380	380	210	AX 1380.000
	600	380	210	AX 1039.000
	500	500	210	AX 1050.000
	800	600	300	AX 1055.000
	500	700	250	AX 1057.000
	600	600	210	AX 1060.000
	600	760	210	AX 1076.000
	760	760	210	AX 1077.000
	1000	760	210	AX 1100.000
	1000	1000	300	AX 1110.000
	1000	760	300	AX 1130.000
	800	1000	300	AX 1180.000
	1000	1200	300	AX 1213.000
	800	1200	300	AX 1280.000

Sub-distributor with mini-comfort handle for sub-distributor lockable with semi-cylinders for handle systems	AX 2537.100
Dust guard trim 1200 mm (for all sub-distributors with ET-Station)	SZ 2467.000
	SZ 2426.500

Cable entry plates and adapter plates – made by Murrplastik

KDP/N 24/11	4x 3.0-6.5mm / 4x 5.0-9.2mm/ 3x 14.0-20.0mm	87301110
KDP/N 24/12	12x 8.0-12.0mm	87301120
KDP/N 24/14	6x 3.0-6.5mm / 4x 5.0-9.2mm/ 4x 9.6-15.9mm	87301140
KDP/N 24/17	17x 5.0-9.2mm	87301150
KDP/N 24/22	16x 3.0-6.5mm / 4x 5.0-9.2mm/ 2x 8.0-12.5mm	87301160
KDP/N 24/23	23x 4.3-8.1mm	87301170
KDP/N 24/29	29x 3.0-6.5mm	87301180
BP/N 24	blanking plate	87171624
KDP/N 24/14	EMC-Module for KDP/N 24/14	87664040
KDP/N 24/23	EMC-Module for KDP/N 24/23	87664070

for Rittal enclosure: Quantity for KDP plates:

KDP 24/AP/RI-AE/4	AE	4	87663070
KDP 24/AP/RI-AE/6+2	AE	6 + 2x M40	87663071
KDP 24/AP/RI-AE/2	AE	2	87663072
KDP 24/AP/RI-KL/1	KL	1	87663073

Still to come for AX enclosure

PC - panel – made by Rittal

PC - panel standard Rittal comfort panel	W520 H600 D152	CP 6372.562
Required front panel	W520 H600 D3	CP 6028.016
with keyboard housing		CP 6373.009
with support for mouse (vertically hinged)		SM 2383.020
with RJ45 installation module (socket/socket) bushing hole d=22.3mm		SZ 2482.730
with cable bushing (M25 gland with split 2-fold sealing insert)		
for keyboard and mouse		
additionally mounted on tabletop base: 2-way shockproof socket IP54		

Mounting with support arm system CP-120 consisting of:

Enclosure coupling, swivel-mounted		CP 6212.300
Support section, open, length 0.5m		CP 6212.150
Support section, open, length 1m		CP 6212.110
Support section, open, length 2m		CP 6212.210
Angle piece 90°		CP 6212.600
Wall / base mounting bracket large		CP 6212.800
or top-mounted hinge	horizontal outlet	CP 6212.700
or wall-mounted hinge	horizontal outlet	CP 6212.740

Cable channel + top-hat rail

The make of the cable duct and the top-hat rail can be freely selected.

Attention: The assembly drawing is designed for a round outer dimension of the channels,

i.e. 80 channel = outer dimension 80 mm

Channel with: 25 – 120 mm

Channel depth: 60/80 mm

Top-hat rail: 35/7.5 or 35/15

Contactors, relays, transistor amplifier

Contactors and relays – made by Siemens

		24V DC		230V AC
Contactor relays	2NO/2NC	S00	3RH2 122-2BB40	-2AP00
	4NO/0NC	S00	3RH2 140-2BB40	-2AP00
	3NO/1NC	S00	3RH2 131-2BB40	-2AP00

AC contactors with DC actuation

24 V DC, with auxiliary contacts 1NO

for motors up to 4.0 kW (max. 5.5 kW)	coil power 4.0W	S00	3RT20 17-2BB42
5.5 kW (max. 7.5 kW)		S00	3RT20 18-2BB42

24 V DC, with auxiliary contacts 1NO 1NC

for motors up to 7.5 kW (max. 11kW)	coil power 5.4W	S0	3RT20 26-2BB40
15kW (max. 18kW)		S0	3RT20 28-2BB40
18.5kW (max. 22kW)	coil power 21.5W	S2	3RT20 36-3KB40
22kW (max. 30kW)		S2	3RT20 37-3KB40
30kW (max. 37kW)		S2	3RT20 38-3KB40
37kW (max. 45kW)	coil power 25W	S3	3RT20 46-3KB40

For control via S7 for size till S3 with coupling relay if necessary 3RH29 14-2GP11

230 V AC 50 Hz, with auxiliary contacts

4.0kW (max 5.5kW)	S0	3RT20 24-2AP00
90kW (max. 90kW)	S6	3RT10 56-2AP36
160kW (max. 160kW)	S10	3RT10 66-2AP36

if required, auxiliary switch block 2NO/2NC for 3RT2...
für 3RT1... 3RH1 921-2XA22-0MA0

Link module electrical and mechanical for 3RV2.. and 3RT2..

Hybrid module for 3RV2.1x screw and 3RT2.1x spring	3RA2911-2FA00
Hybrid module for 3RV2.2x screw and 3RT2.2x spring	3RA2921-2FA00
Link module for 3RV2.3x screw and 3RT2.3x screw	3RA2931-1AA00

DC contactors with 24 V DC actuation

Relay 24 V DC	1CO, hard gold-plated	3RQ3 018-2AB01
Relay 24 V DC	1CO	3RQ3 018-2AB00

Transistor amplifier for brakes/couplings – made by Phönix

max. 5A DC	type OPT-24DC/24DC/5	2982100
with relay socket	type RIF-1-BPT/2X21	2900931
with retaining bracket for relay socket	type RIF-RH-1	2900953
with plug-in module (varistor and LED)	type RIF-V-12-24VUC	2900942
Plug-in bridge	blue for A2 type FBS 2-6 BU (3036932) red for L+ type FBS 2-8 (3030284)	

Coupling relays for cross signals/ contactor control – made by Phönix

1CO, 230 VAC	type REL-MR-230AC/21HC AU	2961529
1CO, 24VDC	type REL-MR-24DC/21HC AU	2961545
with relay base	type RIF-1-BPT/2X21	2900931
with retaining bracket for relay socket	type RIF-RH-1	2900953
with plug-in module (varistor and LED)	type RIF-V-12-24VUC	2900942
or plug-in module for 230 V	type RIF-V-120-230VAC	2900944
Plug-in bridge	blue for A2 type FBS 2-6 BU (3036932) red for L+ type FBS 2-8 (3030284)	

AC contactor with 24 V DC, for reversing mech. & electrically interlocked

for motors up to 11.0 kW	3RA2 326-8XB30-2FB4
for motors up to 18.5 kW	3RA2 328-8XB30-2FB4

Star delta starter, AC actuation		24V DC	230V AC
Motors up to	15 kW (max. 18.5 kW)	3RA2 425-8XF32-2BB4	-2AL2
	30 kW	3RA2 434-8XF32-1NB3	-1AL2
	45 kW	3RA2 436-8XF32-1NB4	-1AL2
	55 kW	3RA2 437-8XF32-1NB4	-1AL2
	75 kW only 230VAC		3RA2 445-8XF32-1AL2
	90 kW only 230VAC		3RA2 446-8XF32-1AL2

160kW consisting of:					
2 pc.	3RT10 56-2AP36	1 pc.	3RT20 47-3AP00	1 pc.	3RP25 74-2NW30
1 pc.	3RA1 953-3G	1 pc.	3RA1 952-2E		
200kW consisting of:					
2 pc.	3RT10 64-2AP36	1 pc.	3RT10 54-2AP36	1 pc.	3RP25 74-2NW30
1 pc.	3RA1 963-3E	1 pc.	3RA1 962-2E		

Exact structure see on mall.industry.siemens.com

Overvoltage protector, varistor

		DC 24-70V Us	AC 170-240V Us
for contactors	S00	3RT29 16-1BB00	-1BD00
	S0	3RT29 26-1BB00	-1BD00
	S2 & S3	3RT29 36-1BB00	-1BD00
(RC-element)	S6 – S12	3RT19 56-1CB00	-1CD00

Current transformers, voltmeters and ampere meters**Current transformer 4-20 mA with voltage supply - make Phönix Contact**

Current transformer	100 A	4-20mA – 3-wire	2308027
	200 A	4-20mA – 3-wire	2308030
	400 A	4-20mA – 3-wire	2308072

Current transformers 0-5 A without voltage supply - make Panta (incoming feeder cubicle)

Current transformer	400-800A	0-5A	ASK61.4
	1000-1500A	0-5A	ASK63.4

Control voltage - 230 V AC

Control transformer SBA Trafo-Tech	400 +/-15V / 230 V, 1.6 kVA	167-1230
Control transformer SBA Trafo-Tech	400 +/- 15V / 230 V, 2.5 kVA	169-1230

Insulation monitoring unit - make Pilz type S1EN, 24-240V AC/DC, 200kOhm Order no. 884 110

Control voltage - 24 V DC

Emergency stop contactor
DC contactor, 40A (4HS), 24V DC operating voltage 3RT2 326-2BB40

Emergency stop switchgear with delayed contact - make Pilz Co. **only spare part**
Type PNOZ XV3P, 30 sec adjustable, UB 24V DC, screw terminals order No. 777510

Load power supply, Phoenix Quint-Power		
QUINT4-PS/3AC/24DC/40A		2904623
QUINT4-UPS/24DC/24DC/40/PN		2907079
QUINT-battery 24VDC/12AH		2320322
QUINT4-PS/3AC/24VDC/20A		2904622
QUINT-battery 24VDC/7.2AH		2320319

Overload relays, thermistor**Electronic overload relays without thermistor evaluation - make Siemens**

4 - 16A	Overload relay, Class 5-30 with stand-alone assembly	3RB31 13-4TE0 3RU29 16-3AC01
12,5 - 50A	Overload relay, Class 5-30E for individual mounting, straight-through transformer	3RB31 33-4UX1
32 - 115A	Overload relay, Class 5-30E for individual mounting, straight-through transformer	3RB31 43-4XX1
50 - 200A	Overload relay, Class 5-30E for individual mounting, straight-through transformer	3RB21 53-4FX2
160 - 630A	Overload relay, Class 5-30E for individual mounting with terminal covers (2 pcs. required) with box terminal block (2 pcs. required)	3RB21 63-4MF2 3RT19 66-4EA1 3RT19 66-4G

Thermistor - motor protector – made by Siemens

Is triggered on failure of the control voltage 3RN20 10-2CA30

Circuit-breaker up to 40 A on rail system – made by Siemens

with auxiliary switch 1NO/1NC

Size S00	0.11 - 0.16 A	3RV20 11-0AA15
	0.14 - 0.20 A	3RV20 11-0BA15
	0.18 - 0.25 A	3RV20 11-0CA15
	0.22 - 0.32 A	3RV20 11-0DA15
	0.28 - 0.40 A	3RV20 11-0EA15
	0.35 - 0.50 A	3RV20 11-0FA15
	0.45 - 0.63 A	3RV20 11-0GA15
	0.55 - 0.80 A	3RV20 11-0HA15
	0.70 - 1.00 A	3RV20 11-0JA15
	0.90 - 1.25 A	3RV20 11-0KA15
	1.10 - 1.60 A	3RV20 11-1AA15
	1.40 - 2.00 A	3RV20 11-1BA15
	1.80 - 2.50 A	3RV20 11-1CA15
	2.20 - 3.20 A	3RV20 11-1DA15
	2.80 - 4.00 A	3RV20 11-1EA15
	3.50 - 5.00 A	3RV20 11-1FA15
	4.50 - 6.30 A	3RV20 11-1GA15
	5.50 - 8.00 A	3RV20 11-1HA15
	7.00 - 10.0 A	3RV20 11-1JA15
Size S0	9.00 - 12.5 A	3RV20 21-1KA15
	11.0 - 16.0 A	3RV20 21-4AA15
	13.0 - 20.0 A	3RV20 21-4BA15
	16.0 - 22.0 A	3RV20 21-4CA15
	18.0 - 25.0 A	3RV20 21-4DA15
	23.0 - 28.0 A	3RV20 21-4NA15
	27.0 - 32.0 A	3RV20 21-4EA15
	30.0 - 36.0 A	3RV20 21-4PA15
	34.0 - 40.0 A	3RV20 21-4FA15
Size S2	35.0 - 45.0 A	3RV20 31-4VA15
	42.0 - 52.0 A	3RV20 31-4WA15
	49.0 - 59.0 A	3RV20 31-4XA15
	54.0 - 65.0 A	3RV20 32-4JA15

Connect ahead:**Disconnecter module for visible isolating distance, 40A Size S00/S0****3RV2928-1A**

Fuses for 24V DC and 230V AC**Fuses for 24V DC – made by E.T.A.**

Buscontroller Profinet	CPC20PN-T2
Fuse, electronic, 2 Channel, 1-10A	ESX60D-SA2-100-DC24V-1A-10A
Base module for circuit-breaker	18plus-AM03-00-PT01-01
Power supply module	18plus-EM03-00-PT01-01
Transfer module	18plus-TM03-00-PT01-01
Busbar	X 222 611 02
FTG-busbar	X 223 571 01
Snap-in hook	Y 311 978 01

Fuses – made by Siemens

Fuse 1-pole type C	2A	55Y6 102 - 7
Fuse 1-pole type C	6A	5SY6 106 - 7
Fuse 1-pole type C	10A	5SY6 110 - 7
Fuse 1-pole type C	16A	5SY6 116 - 7
Fuse 2-pole type C	6A	5SY6 206 - 7
Fuse 2-pole type C	10A	5SY6 210 - 7
Fuse 2-pole type C	16A	5SY6 216 - 7
with auxiliary switch 1NO/1NC		5ST3 010
with busbar		

Terminals and Equipment**Terminals – made by Phönix**

Mounting rail for PE 16 mm ²	type NS 35/7.5 at choice	0801733
Standard terminal	PT4-QUATTRO (old UK5N)	3211797
	PT4-QUATTRO BU	3211802
	PT10	3212120
	PT16N	3212138
	PTPOWER 35	3212064
	PTPOWER 50	3260050
Protective conductor terminal	PT4-QUATTRO-PE	3211809
	PT10-PE	3212131
	PT16N-PE	3212147
	PTPOWER 35-PE	3212066
	PTPOWER 50-PE	3260052
	Make Rittal 2.5-16 mm²	SV3456.500
	Make Rittal 16-50 mm²	SV3457.500
	Make Rittal 70-185 mm²	SV3459.500
Four-level motor terminal	PT 2.5-PE/3L	3210542
	PT 4-PE/3L	3210442
6mm double-level terminals	PTTB 2.5 bridgeable at the top	3210567
Three-level installation terminals with N-busbar up to 4mm ²	PTI 2,5-PE/L/NT	3213946
N-busbar 3x10mm 1m	NLS-CU3/10	0402174
Three-tier sensor terminal block with diode	PTIO 1.5/S/3-LED 24GN	3244436
Three-tier sensor terminal block without diode	PTIO 1.5/S/3	3244410
In addition feed-in terminal	PTIO IN 2.5/3 OG	3244559
Three-tier sensor terminal block without diode	VIOK 1.5-2D	2718196
Terminals for encoder boxes	PT 2.5	3209510
End clamp for quick mounting (50UoS)	Clipfix 35	3022218
Terminal strip marker carriers	KLM	1004306
Support bracket for busbars	AB-SS-M	3025888

Terminal Equipment – made by Wago

Busbar Carrier	790-302
Shield clamping saddle 11mm width	790-108
Shield clamping saddle 43mm width	790-140

Operating elements, indicator lights**Operating elements, indicator lights for main control panels - make Schlegel**

Type QUARTRON Jewel installation opening 24 x 24 mm / IP65

Pushbutton without contactor		QXJT
Selector switch, black	2 switch positions: 0-1, or 1-2	QXJWA
	3 switch positions: 1-O-2 or O-1-2	QWJWB
Blank caps, anthracite		QX24
Illuminated key contact maker	1NC/1NO with socket T5.5 K	ATL
Touch contact maker	2NC/2NO	AT2
Lamp socket	Socket T5.5K	AL5
Push button caps flat, transparent	clear	T25FKL
	green	T25FGN
	red	T25FRT
	blue	T25FBL
LED ultra-bright, base T5.5K	white	L5,5K24UW
	green	L5,5K24UG
	red	L5,5K24UR
	blue	L5,5K24UB
Flat receptacles 2.8 mm x 0.8 mm		FH2,8
flat plug distributor for 2 flat receptacles		FD2,8
Service tool lamp extractor with cap lifter		LZ5

Operating elements, indicator lights for other control - make Siemens

Push-button, switches, indicator lights,... SIRIUS Act 3SU1...

Smooth start

Smooth start control unit – made by Siemens

Up to 55kW motor power is available in type series 3RW30.../ 3RW40...

Sine wave filter

Sine wave filter for installation after the frequency inverter

Sine-wave filter for FC-302 P5K5 and P7K5 in book size	IP20	130B2446
Sine-wave filter for FC-302 P11K in book size	IP20	130B2447

Frequency converter FC302

**Frequency converter – made by Danfoss VLT-AutomationDrive, series FC302 IP 20 400 V
Standard comes with Profinet, graphics operating unit and coated control board**

Profibus converter card for FC302 (Implementation of the VLT5000 parameter)	MCA 114
Incremental encoder Option MCB 102	130B1203
Resolver Option MCB 103	130B1227

Frequency converter up to VLT P7K5, book size

Up to 0.55 kW motor	PK55 standard with brake chopper FC-302PK55T5E20H1BGCXXXSXXXXALBXCXXXXDX	131N6458
	Flatpack braking resistor 830Ohm, 100W	175U1000
Up to 1.1 kW motor	P1K1 standard with brake chopper FC-302P1K1T5E20H1BGCXXXSXXXXALBXCXXXXDX	134L5987
	Flatpack braking resistor 430Ohm, 100W	175U0983
Up to 2.2 kW motor	P2K2 standard with brake chopper FC-302P2K2T5E20H1BGCXXXSXXXXALBXCXXXXDX	131N6462
	Flatpack braking resistor 2pcs. parallel 430Ohm, 200W	175U0983
Up to 4.0 kW motor	P4K0 standard with brake chopper FC-302P4K0T5E20H1BGCXXXSXXXXALBXCXXXXDX	131U7862
	Flatpack braking resistor 2pcs. parallel 240Ohm, 200W	175U0986
Up to 5.5 kW motor	VLT P5K5 standard with brake chopper FC-302P5K5T5E20H1BGCXXXSXXXXALBXCXXXXDX	134F7574
	Flatpack braking resistor 2pcs. parallel 160Ohm, 200W	175U0988
Up to 7.5 kW motor	P7K5 standard with brake chopper FC-302P7K5T5E20H1BGCXXXSXXXXALBXCXXXXDX	131N7062
	Flatpack braking resistor 2pcs. parallel 130Ohm, 200W	175U0990

Frequency converter up to VLT P7K5 with IMC, book size

Up to 1.1 kW motor	P1K1 standard with brake chopper, IMC FC-302P1K1T5E20H1BGCXXXS067XALBXCXXXXDX	136H6213
	Flatpack braking resistor 430Ohm, 200W	175U0983
Up to 2.2 kW motor	P2K2 standard with brake chopper, IMC FC-302P2K2T5E20H1BGCXXXS067XALBXCXXXXDX
	Flatpack braking resistor 2pcs. parallel 430Ohm, 200W	175U0983
Up to 4.0 kW motor	P4K0 standard with brake chopper, IMC FC-302P4K0T5E20H1BGCXXXS067XALBXCXXXXDX	136U1265
	Flatpack braking resistor 2pcs. parallel 240Ohm, 200W	175U0986
Up to 5.5 kW motor	VLT P5K5 standard with brake chopper, IMC FC-302P5K5T5E20H1BGCXXXS067XALBXCXXXXDX
	Flatpack braking resistor 2pcs. parallel 160Ohm, 200W	175U0988
Up to 7.5 kW motor	P7K5 standard with brake chopper, IMC FC-302P7K5T5E20H1BGCXXXS067XALBXCXXXXDX	136U2877
	Flatpack braking resistor 2pcs. parallel 130Ohm, 200W	175U0990

Component list for electrics

Frequency converter VLT P11K with IMC, compact size

Up to 11/15 kW Motor	P11K Standard with brake chopper, IMC	136L5083
	FC-302P11KT5E20H1BGCXXXS067XALBXCXXXXDX	
	Flatpack braking resistor 2pcs. parallel 80Ohm, 240W	175U0090

Frequency converter FC302 from VLT P11K – P75K, compact size

Up to 11/15 kW Motor	P11K Standard with brake chopper	131N7060
	FC-302P11KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Flatpack braking resistor 2pcs. parallel 80Ohm, 240W	175U0090
Up to 15/18.5 kW Motor	P15K Standard with brake chopper	131N7061
	FC-302P15KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Flatpack braking resistor 2pcs. parallel 72Ohm, 240W	175U0091
Up to 18.5/22 kW Motor	P18K standard	131U2472
	FC-302P18KT5E20H1XGCXXXSXXXXALBXCXXXXDX	
	VLT P18K standard with brake chopper	131N5655
	FC-302P18KT5E20H1BGCXXXSXXXXAIBXCXXXXDX	
	Braking resistor 25Ohm, 3500W	175U1850
Up to 22/30 kW Motor	P22K standard	131N7556
	FC-302P22KT5E20H1XGCXXXSXXXXALBXCXXXXDX	
	VLT P22K standard with brake chopper	131U1360
	FC-302P22KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Braking resistor 20Ohm, 4000W	175U1851
Up to 30/37 kW Motor	P30K standard	131N6449
	FC-302P30KT5E20H1XGCXXXSXXXXALBXCXXXXDX	
	VLT P30K standard with brake chopper	131N5656
	FC-302P30KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Braking resistor 15Ohm, 4800W	175U1852
Up to 37/45 kW Motor	P37K standard	131N7557
	FC-302P37KT5E20H1XGCXXXSXXXXALBXCXXXXDX	
	VLT P37K standard with brake chopper	131X8091
	FC-302P37KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Braking resistor 12Ohm, 5500W	175U1853
Up to 45/55 kW Motor	P45K standard	131N7558
	FC-302P45KT5E20H1XGCXXXSXXXXALBXCXXXXDX	
	VLT P45K standard with brake chopper	135N5658
	FC-302P45KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Braking resistor 9.8Ohm, 10kW	175U2008
Up to 55/75 kW Motor	P55K standard	131X0156
	FC-302P55KT5E20H1XGCXXXSXXXXALXCXXXXDX	
	VLT P55K standard with brake chopper	135X8206
	FC-302P55KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Braking resistor 7.3Ohm, 13kW	175U0069
Up to 75/90 kW Motor	P75K standard	131N6448
	FC-302P75KT5E20H1XGCXXXSXXXXALBXCXXXXDX	
	VLT P75K standard with brake chopper	131U9591
	FC-302P75KT5E20H1BGCXXXSXXXXALBXCXXXXDX	
	Braking resistor 6.0Ohm, 15kW	175U0067

Frequency converter from VLT, compact format, cabinet installation with stand-alone installation

Up to 90/110 kW Motor	N90K Standard	134H8491
Up to 110/132 kW Motor	N110 Standard	134G4770
Up to 132/160 kW Motor	N132 Standard	134H3473
Up to 160/200 kW Motor	N160 Standard	134H1888
Up to 200/250 kW Motor	N200 Standard	134L3430

More types up to 800 kW if required

Simatic S7 1500 and network components
S I M A T I C S7 1500 - BASIC COMPONENTS

Mounting Rail, e.g. 245mm	6ES7590-1AC40-0AA0
Central processing unit CPU 1518F-4 PN/DP +Memory Card 2 GB	6ES7518-4FP00-0AB0 6ES7954-8LP02-0AA0
Central processing unit CPU 1512F-1 PN for burner +Memory Card 4 MB +Busadapter 2xRJ45	6ES7512-1SK01-0AB0 6ES7954-8LC03-0AA0 6ES7193-6AR00-0AA0

S7-300 / S7-400 / ET200M / ET200S / Profibus components

If necessary this components will be used in coordination with KE

Profinet / Ethernet network components

SCALANCE XC216-4C G switch, managed 16xRJ45 (4xSFP)	6GK5216-4GS00-2AC2
SCALANCE XC206-2SFP G switch, managed 6xRJ45, 2xSFP	6GK5206-2GS00-2AC2
SCALANCE X101-1 ProfiNet OLM	6GK5101-1BB00-2AA3
SIMATIC IPC227E Nanobox PC	6ES7647-8BB22-7CA3
SCALANCE X plug-in transceiver SFP992-1+	6GK5992-1AG00-8AA0
IE FC RJ45 Modular Outlet with 2x 100Mbit Interchangeable insert with 1x1Gbit	6GK1901-1BE00-0AA1 6GK1901-1BK00-0AA2
IE FC RJ45 plug 4x2 (1 pack =1 pcs) IE FC RJ45 plug 4x2 (1 pack =10 pcs)	6GK1901-1BB11-2AA0 6GK1901-1BB11-2AB0
IE FC RJ45 plug 90° 2x2 (1 pack =1 pcs) IE FC RJ45 plug 90° 2x2 (1 pack =10 pcs)	6GK1901-1BB20-2AA0 6GK1901-1BB20-2AB0
Profinet stripping tool for FastConnect cables	6GK1901-1GA00

Simatic ET200SP assemblies**Accessories for ET 200 SP**

Interface IM 155-6 PN HF/2 V4.2 High Feature for PN with busadapter: 2 x RJ45 Profinet 2 x LC Profinet LC / RJ45 Profinet		6ES7 155-6AU01-0CN0 6ES7 193-6AR00-0AA0 6ES7 193-6AG00-0AA0 6ES7 193-6AG20-0AA0
Digital input	8 inputs DC 24 V 16 inputs DC 24 V	6ES7 131-6BF01-0BA0 6ES7 131-6BH01-0BA0
Digital output	4 outputs DC 24 V / 2 A 8 outputs DC 24 V / 0.5 A 16 outputs DC 24 V / 0.5 A	6ES7 132-6BD20-0BA0 6ES7 132-6BF01-0BA0 6ES7 132-6BH01-0BA0
Analog input module	4 inputs I 2/4 wire 4 inputs RTD/TC 4 inputs U/I 2 wire 4 inputs I 2/4 wire HART	6ES7 134-6GD01-0BA1 6ES7 134-6JD00-0CA1 6ES7 134-6HD01-0BA1 6ES7 134-6TD00-0CA1
Analog output module	4 outputs U/I	6ES7 135-6HD00-0BA1
F-digital input	8 F-inputs DC 24 V	6ES7 136-6BA00-0CA0
F-digital output	4 F-outputs DC 24 V / 2A	6ES7 136-6DB00-0CA0
Counter module	TM Counter 1 x 24VDC	6ES7 138-6AA01-0BA0
SSI-module	TM PosInput 1	6ES7 138-6BA00-0BA0
Modbus module	CM PtP (Freeport, 3964R, USS, Modbus RTU)	6ES7 137-6AA00-0BA0
Weighing module	WP321, Siwarex, 1-channel	7MH4138-6AA00-0BA0
Terminal module 15mm	BU A0, 10 AUX separated (supply)	6ES7 193-6BP20-0DA0
Terminal module 15mm	BU A0, 10 AUX connected	6ES7 193-6BP20-0BA0
Color-coded labels according to the material list		
Relay output 4xRQ	4 outputs 120VDC, 230VAC	6ES7132-6HD01-0BB1
Terminal module 20mm	BU B0, 4 AUX	6ES7193-6BP20-0BB0
F-relay output 1xF-RQ	1 F-output 24VDC/24-230VAC/5A	6ES7136-6RA00-0BF0
Terminal module 20mm	BU F0	6ES7193-6BP20-0BF0
F-Power module	F-PM-E 24VDC/8A PPM ST	6ES7 136-6PA00-0BC0
Terminal module 15mm	BU C0, supply	6ES7 193-6BP20-0DC0
Motor starter direct	F-DS 0,1-0,4A HF	3RK1308-0CA00-0CP0
Motor starter direct	F-DS 0,3-1,0A HF	3RK1308-0CB00-0CP0
Motor starter direct	F-DS 0,9-3,0A HF	3RK1308-0CC00-0CP0
Motor starter direct	F-DS 2,8-9,0A HF	3RK1308-0CD00-0CP0
Motor starter direct	F-DS 4,0-12,0A HF	3RK1308-0CE00-0CP0
Motor starter reversible	F-RS 0,1-0,4A HF	3RK1308-0DA00-0CP0
Motor starter reversible	F-RS 0,3-1,0A HF	3RK1308-0DB00-0CP0
Motor starter reversible	F-RS 0,9-3,0A HF	3RK1308-0DC00-0CP0
Motor starter reversible	F-RS 2,8-9,0A HF	3RK1308-0DD00-0CP0
Motor starter reversible	F-RS 4,0-12,0A HF	3RK1308-0DE00-0CP0
Terminal module	BU30-MS7, power / F-DI supply	3RK1908-0AP00-0GP0
Terminal module	BU30-MS9, power / F-DI forwarding	3RK1908-0AP00-0JP0
Air fan	included at 4,0-12,0A	3RW4928-8VB00

Balluff I/O-module and accessories

Active (Master) I/O-link distributor	16DI/DO / 8IO Link	BNI005H
Passive (Slave) distributor	16DI/DO	BNI004L
Passive (Slave) distributor	16DI/DO	BNI00CM
Passive (Slave) Safety-distributor	4F-DI/2F-DO/2F-DI_DO	BNI0098
Cables according to specification / material list from KE, samples:		
Conf. wire 2xM12	5-pole 1m	BCC09FN
Conf. wire 2xM12	5-pole 1.5 m	BCC09FP
Conf. wire 2xM12	5-pole 2 m	BCC09FR
Conf. wire 2xM12	5-pole 5 m	BCC09FU
Conf. wire 7.8"->off	5-pole 15 m	BCC0CR8
Conf. wire 7.8" -> 7.8"	5-pole 5 m	BCC06FP
Conf. wire M12->RJ45PN	5-pole 15 m	BCC04ZJ
Conf. wire M12->M12PN	5-pole 15 m	BCC04K2
Plug M 12	5-pole	BCC08C0
Plug 7.8"	5-pole	BCC070F
Valve-wire Form A->M12	5-pole	BCC04WH
T-splitter	7.8"	BCC0AA7
Screw plug	7.8"	BAM012U
Screw plug	7.8"	BAM012T
Screw plug	M12	BAM01C2

EMERGENCY STOP button, safety switches, switches for doors and safety grids**Devices on site EMERGENCY STOP button – made by Siemens**

Installation with key:	yellow / red	3SU1000-1HR20-0AA0
Installation without key	yellow / red	3SU1000-1HB20-0AA0
Holder (required)		3SU1500-0AA10-0AA0
with additional switching elements 2NC		3SU1400-1AA10-1EA0
with protective collar – height 61.5 mm:	yellow	3SU1900-0DY30-0AA0
Setup with large protective collar	yellow / red	3SU1801-0NA00-2AC2
with additional switching elements 1NC		3SU1400-2AA10-1CA0
Installation: for burner shutdown	black	3SU1000-1BA10-0AA0
Holder (required)		3SU1500-0AA10-0AA0
with protective collar	grey	3SU1900-0DY80-0AA0

Safety switches

Pull rope emergency stop switch with max. 2 x 50 m rope length	PRS 001	made by Kiepe 91.063 293.001
Rip cord red	94.045 731.021	swing hooks M10
Rope turnbuckle	93.098 411.102	tension spring170x20mm
Ovoid terminal size3	94.047 869.001	Eye bolt M12x60
Conveyor belt tracking switch with advance warning,	MAS	91.050 688.001

Emergency switch (mech.)

with snap-action contact:		made by Siemens
Pivot lever (11mm switching travel difference)		3 SE5 112-0CH01
Tappet (1mm switching travel difference)		3 SE5 112-0CC02
Rope pull without detent position (80N)		3 SE7 120-2DD01

Level indicator (bucket-elevator)

made by H.Grieb
MK 508 Vt 05 (13-780)

Switches for doors and safety grids

Safety position switch		made by Leuze
with 5 approach directions	type S20-P1C1-M20-FH	63000101
Actuator straight	type AC-AN-S	63000700
angled	type AC-AN-A	63000701
flexible	type AC-AN-F4	63000702
short / angled	type AC-AN-ASH	63000707
Safety door interlocking device with guard locking, 4 approach directions, actuator included		
24V DC, 1200mA	Type L300-M31M12B8-SLM24-UCA	50132202
Actuator (spare)	Type AC-L300-UCA	50132062

Safety door interlocking device with magnetic guard locking **Standard -**

500 N	24V DC, 4.8W	PSEN sl-0.5p 1.1 / PSEN sl-0.5 1unit	made by Pilz 570500
1000 N	24V DC, 7.2W	PSEN sl-1.0p 1.1 / PSEN sl-1.0 1unit	570600
Cable		PSEN cable angle M12 8-pole 30m	540325

Component list for electrics

Repair switch

Main switch as repair switch

made by Siemens

Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 7.5 kW, 3-pole	3LD2 064-1GP51
Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 11.5 kW, 3-pole	3LD2 264-1GP51
Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 22 kW, 3-pole	3LD2 565-1GP51
Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 37 kW, 3-pole	3LD2 766-1GP51
Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 45 kW, 3-pole	3LD2 866-1GP51
Main switch with rotary actuator black, auxiliary switch 6H + 1NO + 1NC 9.5 kW, 6-pole	3LD2 165-4VD51
Main switch with rotary actuator black, auxiliary switch 6H + 1NO + 1NC 11.5 kW, 6-pole	3LD2 265-4VD51
Main switch with rotary actuator black, auxiliary switch 6H + 1NO + 1NC 22 kW, 6-pole	3LD2 566-4VD51

with rotary actuator yellow/red Final number :53

Main control switch as repair switch

made by Kraus + Naimer

Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 55 kW, 3-pole	KG160 T103/41 STM
Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 90 kW, 3-pole	KG250 T103/43 STM
Main switch with rotary actuator black, auxiliary switch 3H + 1NO + 1NC 110 kW, 3-pole	KG315 T103/43 STM
Main switch with rotary actuator black, auxiliary switch 6H + 1NO + 1NC 37 kW, 6-pole	KG100C T106/41 STM
Main switch with rotary actuator black, auxiliary switch 6H + 1NO + 1NC 45 kW, 6-pole	KG125C T106/88 STM
Main switch with rotary actuator black, auxiliary switch 6H + 1NO + 1NC 55 kW, 6-pole	KG160C T106/88 STM

Component list for electrics

Relay switch

made by Sontheimer Elektroschaltgeräte GmbH

Step switch Actuator grey/black	A-O-H-T	WAE1199/8PLM/Z33SW/54/X85
Reversing switch Actuator grey/black	1-0-2	WAE1200/8PLM/Z33S

Field indicator

Field indicator IP65, 5-digit LCD display - make Endress+ Hauser

2-wire, 4-20 mA current loop, cable entries, installation M16, mounting kit	RIA16-AA1A+E1+I2
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Position Sensor

Linear position sensor - make Balluff

Magnetostrictive linear position sensor, M12 plug (standard)	BTL1L7P
Operating voltage 24V DC, IO-Link	
With magnet for profile style	BAM014H

Signalers

Made by Funke Huster Fernsig

Three-tone horn EV 24	12/24V DC, 0.16A	215 613 01
rotating mirror beacon SLD 1	24V DC, 3A	red 222 002 02
		yellow 222 002 03
Signalling light BLG LED	24V DC, 0.3A	yellow 221 513 03

Absolute encoder with SSI, pulse encoder and couplings**Absolute encoder with SSI interface****made by Wachendorff**

Absolute encoder	Type WDGA 58A SSI
Single-turn resolution: 13bit	
Supply: 10 - 30 V DC	58A061312SIAG01L3H98
Interface SSI, 1m cable, plug, 8-pole	
Cable box, 8-pole with 40 m cable	KI86740SSI
Needed in control/sub-distributor: SSI functional module for ET200M/S, see: Simatic S7 300 and ET200 assemblies	

Pulse encoder**made by Wachendorff**

Incremental encoder 100 pulses/rev. with 1m of cable, plug, 8-pole	10-30 V DC	Typ WDG 58A100 58A10036L3H98
Incremental encoder 1000 pulses/rev. with 1m of cable, plug, 8-pole	10-30 V DC	Typ WDG 58A1000 58A100036L3H98
Cable Box 8-pole with 40 m cable		KI86740S
Needed in control/sub-distributor: Counter functional module for ET200M/S, see: Simatic S7 300 and ET200 assemblies		

Couplings for pulse encoder and absolute encoder made by Schmidt-Kupplung

CONTROLFLEX CPS 9/1 for shaft diameter 6mm / 6mm	20039
CONTROLFLEX CPS 9/1 for shaft diameter 6mm / 10mm	20041
CONTROLFLEX CPS 9/1 for shaft diameter 10mm / 10mm	20047

Other encoders can be used in coordination with KE. For this purpose the specification of KE must be observed.

M12 Quick-connector plugs**M12 Quick-connector plugs for encoder and light barriers****made by Phönix**

Plug	M12x1, 4-pole, straight	SACC-MS-4QO-0,75-M SCO	1521591
Socket	M12x1, 4-pole, straight	SACC-FS-4QO-0,75-M SCO	1521601
	M12x1, 4-pole, angled	SACC-FR-4CON-PG 7-M SCO	1543058
	M12x1, 5-pole, straight	SACC-FS-5CON-PG 9-M SCO	1543045
	M12x1, 8-pole, straight	SACC-M12FS-8CON-PG11-M	1410665
	M12x1, 8-pole, straight, shielded	SACC-M12FS-8Q SH	1553640

Sensors and evaluation devices**Inductive and capacitive sensors & evaluation devices****made by IFM**

Inductive M18 with M12 plug (Standard) type: IGK3008BBPKG/K1/US-104	IGS277
Inductive M30 with M12 plug (Standard) type: IIK3015BBPKG/K1/US-104	IIS267
Inductive M12 with M12 plug (special cases) type: IFK3004BFRKG/IO/US-104	IF6123
Inductive for Zyl. With M12 plug (special cases) type: MKT3020BBPKG/A/0,3M/ZH/US	MK5139

Sensors for speed monitoring with integrated evaluating electronics - made by Turck

Initiators for speed monitoring M18, with cable Ident. no. 1582236	DBi5U-M18E-AP4X3
Initiators for speed monitoring M30, with cable Ident. no. 1582231	DBi10U-M30-AP4X2

Ultrasonic sensors for distance measurement tasks**made by IFM**

Ultrasonic sensor M18 with M12 plug, 15-160cm output 4-20mA, 1 NO, configuration changeable IOL, teach-switch type: UGA01600E1KG/IO-LINK/US	UGT510
Ultrasonic sensor M30 with M12 plug, 25-350cm output 4-20mA, 1NO, configuration changeable:IOL, teach-switch type: UIA03500E1KG/IO-Link/US	UIT501

ultrasonic sensor on mill and grate belt**made by Pepperl+Fuchs**

ultrasonic sensor 50-500 mm, outgoing 4-20mA, required M12- socket 5-pole	UC500-30GM-IUR2-V15
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Inductive sensors for flaps, ball valves and other rotary actuators **made by IFM**

Inductive sensor for rotary actuators – standard	IN5327
Target pucks for rotary actuators, 53mm, Basic	E12517
Target pucks for rotary actuators, 53mm, Adjustable	E12516
Spacer 10mm for Puck	E12526
Position Sensor for rotary actuators – IO-Link, actual value	MVQ101

Component list for electrics

Light barriers and light arrays**Light barriers****made by Leuze**

Reflection light scanner with background suppression standard scanning range - 800 mm	HRT 96 M/P-1630-800-41
Laser light barrier with reflector scanning range 21m Bracket for PRKL type BTU300M-D12 Reflector type: MTKS 50x50.1 Bracket for MTKS type BT450.3-96	PRKL 8/24.91-S12 501 17252 501 175583 501 04897
Light barrier with reflector scanning range 8m reflector type: TKS 100x100 scanning range 5m reflector type: TKS 50x50	PRK96M/P-1370-42 50022816 50022814
One-way light barrier, transmitter and receiver Transmitter sep. Receiver sep.	LS 96 M/P-1170-4 500 32129 500 25197
Laser light scanner with background suppression Scanning range 35 mm	HRTL8/66-350-S12
Laser distance sensor 150-2000 mm output 4-20mA with socket M12, 5-pole	ODSL 96B M/C 6-2000-S12
Laser distance sensor 20-400 mm output 1-10 V/4-20mA with socket M12, 5-pole	ODSL 8/C66-500-S12

Light barrier with light strip for object recognition (Stacking table entrance/exit)

Light barrier with reflector scanning range 4m reflector type: TKS 100x100 scanning range 3m reflector type: TKS 40x60	RK46C.DXL3/4P-M12 50022816 50040820
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Manometer and temperature measuring

Manometer

made by E+H

Cerabar T, PMC 11 (monitoring compressed air supply, tensioning station, setting belt) Range 0-1 bar, G 1/2" 4-20 mA Range 0-10 bar, G 1/2" 4-20 mA Range 0-40 bar, G 1/2" 4-20 mA	PMC11-AA1L1HBWBJA+Z1 PMC11-AA1L1PBWBJA+Z1 PMC11-AA1L1SBWBJA+Z1
Cerabar S, PMC 71(monitored combustion air, secondary air...) Range up to 100mbar G 1/2" 4-20 mA , mounting bracket + shutoff valve	PMC71-AAA1CEGAAAU+Z1 PZAV-R1A1
Deltabar S, PMD 75 Range up to 100mbar, incl. 2 valves G 1/2" 4-20 mA Deltatop DA63M valve block	PMD75-AAJ7DE11AAU+Z1 DA63M-1035/0
Deltatop DP62D dynamic pressure probe to be specified with form (installation position, heating,...)	

Temperature measuring PT 100 – made by E+H

Room temperature sensor 50 mm fitting length Peak reduced, process connection, G 1/2", screw-in design for use in control cabinets (control room)	TMR31-A1CABBAB1AAA+A Range -50/100°C
Room temperature sensor Measuring range to specify For use in switchgear containers Head transmitter TMT 187 built-in, 4-20 mA, 2-wire	TST 434-J1B3B4+TZ1 Range -30/100°C
Temperature sensor 50 mm fitting length Peak reduced, process connection, G 1/2", screw-in design Head transmitter TMT 187 built-in, 4-20 mA, 2-wire	TSM 487-AFH+A Range 0 -200°C
Temperature sensor 100 mm fitting length Peak reduced, process connection, G 1/2", screw-in design Head transmitter TMT 187 built-in, 4-20 mA, 2-wire	TSM 487-BFH+A Range 0-200°C
Temperature sensor TR 12 240 mm fitting length Peak reduced, process connection, G 1/2", screw-in version Head transmitter TMT 181 built-in, 4-20 mA, 2-wire	TR12-ABF1WCG70000+TZ1 Range 0-400°C
Temperature sensor TR 12 700 mm fitting length Peak reduced, process connection TA50-KP, G 1/2", compressed ring Top transmitter TMT 181 built-in, 4-20 mA, 2-wire	TR12-ABF1WMG70000+TZ1 Range 0-400°C X=20 -4000 mm
Temperature sensor TR 12 1300 mm fitting length Peak reduced, process connection TA50-KP, G 1/2", compressed ring Top transmitter TMT 181 built-in, 4-20 mA, 2-wire	TR12-ABF1WXP70000+TZ1 Range 0-400°C X=20 - 4000 mm
Head transmitter TMT 181 product run-out 10/2022 Range 0-400°C, 4-20 mA, 2-wire	TMT181-A31BA
New alternatives Head transmitter TMT 71 head transmitter Range 0-400°C, 4-20 mA, 2-wire, Bluetooth or cable configuration	TMT71-AAP1BAAA1
Head transmitter TMT 71 top-hat rail Range 0-400°C, 4-20 mA, 2-wire, Bluetooth or cable configuration	TMT71-AAP2BAAA1

+Z1 / +A / +TZ1 = TAG marking, metal / stainless steel sticker

Component list for electrics

Thermocouple sensor TAF 12T 710 mm fitting length
Process connection special design
Top transmitter TMT 181- A built-in, **4-20 mA, 2-wire**

TAF12T-34THX4B9FP+TZ1
Range 0-1600°C
X=710 mm

Thermocouple sensor TAF 16 790 mm fitting length
Process connection screwing, G 1"
Top transmitter TMT 181- A built-in, **4-20 mA, 2-wire**

TAF16-171G1M3PFP+TZ1
Range 0-1100°C
X=790 mm

Thermocouple TST 310 300 mm fitting length
For screw-in, type: MgO, 316L
Specified length of thermocable: 4000 mm

TST310-B4A1A3A4C1A+TZ1

parameterization set for head transmitter
with software, 4-pole cable (-> USB) and M12 adapter

TXU10-AA

+TZ1 = TAG marking, metal / stainless steel sticker

Temperature measuring contactless (infrared) – made by IFM

TW2000 Infrared Temperature measuring
with mounting bracket

TW-030KLBM30-KFDKG
E10077

Safety thermostat, flame detection, actuating drive**Setup – Thermostat, safety temperature monitor – made by Jumo**

Safety temperature monitor Type ATHs-20 Art. No. 60002680
with 1 change-over contact, control range +20 to +500 °C
Process connection G ½", fitting length 600 mm

Flame detection – made by Lamtec

Compact flame detector F200K2 UV-1 Order no. 659 R 6004
Electrical connection via configured patch cord
1 change-over contact, flame intensity adjustable
Process connection, tube exterior diameter=40mm, with adjustment bracket necessary

Configured connection cable for F200K2, 3m Order No.: 659 R 6112
Configured connection cable for F200K2, 5m Order No.: 659 R 6113
Configured connection cable for F200K2, 10m Order No.: 659 R 6114

Adjustment bracket FS 30/10 process connection G1" Order No.: 659 S 1500
with purge air connection G1/2" inserted laterally
Construction length of adjustment bracket with flame detector F200K2 approx. 26 cm

Actuating drive for gas/air – made by Schimpf

Control actuator 01-15/30ST AB414/P, 20Nm, positioning time 30s Order note "KNAUF"
Stainless steel shaft, length 30mm, D=12mm with feather key
Stepper motor control, manual adjustment push-button open / closed,
2 additional switches potential-free, position feedback 4-20mA
Voltage 24 V DC, Actual position encoder: Poti made by Novotechnik

Level measurements of solids

Single vibration level limit switch for bulk goods (not powdery)

SOLIPHANT T FTM 20 10-55V DC, PNP, R1 1/2"	FTM 20-AG22A+1 225 mm probe length
SOLIPHANT T FTM 21 10-55V DC, PNP, R1 1/2" with sliding sleeve	FTM 21- AG222A+1 500 mm probe length
SOLIPHANT T FTM 21 10-55V DC, PNP, R1 1/2" with sliding sleeve	FTM 21- AG322A+1 1000 mm probe length
Sliding sleeve R1 1/2" VA, for FTM21	Order No.: 5202 3313

Vibration level limit switch for bulk goods (not coarse-grained)

SOLIPHANT FTM 50 10-55V DC, PNP R1 1/2"	FTM 50-AGG2A2A12AA+1 155 mm probe length
SOLIPHANT FTM 51 10-55V DC, PNP R1 1/2" with sliding sleeve G2"	FTM 51- AGG2L2A12AA+1 500 mm probe length
SOLIPHANT FTM 51 10-55V DC, PNP R1 1/2" with sliding sleeve G2"	FTM 51- AGG2L2A12AA+1 1000 mm probe length
Sliding sleeve G2" VA FOR FTM51	Order No.: 52024631
SOLIPHANT FTM 52, cable version 10-55V DC, PNP, length: config.	FTM 52- AGG2B2A12AA+1 2000 mm overall length

Level limits with directed micro-wave

Levelflex FMP57 with 6mm rope, 4-20 mA 2-wire FMP57-AAACAALCA4GGE+AAZ1
Specify probe length (max. 45m), other operating languages selectable AA - Display = DE/EN

Levelflex FMP56 with 4mm rope, 4-20 mA 2-wire FMP56-AAACAALAABGDE+AAZ1
Specify probe length (max. 12m), other operating languages selectable AA - Display = DE/EN

Level limits with ultrasonic

Prosonic T FMU30 - make E & H FMU30-AAGEAAGGF+Z1
Range: 0.25 - 2M = 4-20mA

Prosonic S FDU91 – make E & H FDU91-RG2AA+1
Range: 0 - 0.5m (bulk goods) + 10 m cable
With evaluation unit FMU90 FMU90-R12CB111AA1A

For all level limits: Choose the appropriate type in ex-zones (ATEX/IECEX)
+1 / +Z1 = TAG marking, metal / stainless steel sticker

Level limits of liquids and flow meters

Level limits – Liquids – made by E+H

Level limits of liquids
Liquiphant PA G1/2"
with M12-socket 4-pole connect

FTL31-AA4M2AAWBJ+Z1

Level limits – continuous, hydrostatic
Cerabar S, PMC 71, G1½" **4-20 mA**
Range up to 0.4 bar (4 m)
Range up to 1 bar (10 m)
Range up to 2 bar
Range up to 40 bar

PMC71-AAA1F11GAAA+Z1
PMC71-AAA1H11GAAA+Z1
PMC71-AAA1K11GAAA+Z1
PMC71-AAA1S11GAAA+Z1

Level limits - conductive
Liquipoint T FTW31
Compact unit, 3 rods, length: config.

FTW31-B1A3AA4A+1

Flow meters

PROMAG H 200
DN 2 - 8
Auxiliary energy 24 V DC 0/4-20mA output and pulse output

sample: 5H2B04-AABECABD5S0A+Z1

PROMAG P 200
DN 15 - 200
Auxiliary energy 24 V DC 0/4-20mA output and pulse output

sample: 5P2B25-AABECAED5S0A+Z1

PROMAG 10D

sample: 10D25-3CGA1AA0A5AA+Z1

Exact Order-No. according to specification / materialist by KE

Flow meter for silicone oil (for all non-conductive liquids)

PROMASS 8A, G1/4" internal thread
Auxiliary energy 24 V DC 0/4-20mA output and pulse output

sample: 8A3C04-AAIBAEFAASAG06AA1+Z1

PROMASS 8E, flange type
Auxiliary energy 24 V DC 0/4-20mA output and pulse output

sample: 8E2C08-AABECASAD2SHA1+Z1

Character set at PROMAG / PROMASS:

Western and Southern Europe
Eastern / Northern Europe (Cyrillic / factory setting English / no German)
Chinese

Ending:

+AA
+AI
+AK

+1 / +Z1 = TAG marking, metal / stainless steel sticker

Control cables and special cables

Cable types

	Diameter	Cable Glands
Control cable, non-shielded with coloured cores, without protective conductor		
Type YSLY-OB BN/BK/GY/BU 4 x 0.75 mm ²	6.4mm	M 16
Control cable, non-shielded with numbered cores		
Type YSLY-IZ		
3 x 0.75 mm ²	5.60mm	M 16
4 x 0.75 mm ²	6.4mm	M 16
5 x 0.75 mm ²	7.0mm	M 16
7 x 0.75 mm ²	7.5mm	M 20
12 x 0.75 mm ²	10.0mm	M 20
18 x 0.75 mm ²	11.8mm	M 25
25 x 0.75 mm ²	13.8mm	M 25
Control cable, shielded with numbered cores		
Type YSLYCY-OZ		
2 x 0.75 mm ²	7.5mm	M 16
Type YSLYCY-IZ		
4 x 0.75 mm ²	8.2mm	M 20
5 x 0.75 mm ²	9.4mm	M 20
7 x 0.75 mm ²	9.6mm	M 25
18 x 0.75 mm ²	14.1mm	M 32

Special cables

	Diameter	Cable Glands
Type LIYCY 3x2x 0.5mm ² for ROD pulse generator Colour code DIN 47 100	5.4mm	M 16
Bus line Sinec-L2 6XV1 830-0EH10 Two-wire lead, Fast Connect, product sold by meter rigid	6.5mm	M 16
Bus line Sinec-L2 6XV1 830-0EH10 Two-wire lead, Fast Connect, product sold by meter flexible	6.5mm	M 16
Profinet cable 6XV1841-2A 2x2x0.75mm ² SF/UTP, Fast Connect, product sold by meter rigid	8.0mm	M16
Profinet cable 6XV1841-2B 2x2x0.75mm ² SF/UTP, Fast Connect, product sold by meter flexible	8.0mm	M16
Equipotential bonding H07V-K ge/gr 1x16mm ²		
SIHF-I (silicone cable) 3x1.0mm ² 4x1.0mm ²		
compensating cable PtRh-Pt/S 2x1.5mm ² temperature resistance: -40°C to +180°C	Producer: Günther	M20 93-10215011-SS

Component list for electrics

Power and motor cables

		Diameter	Cable Glands
Type YSLY-IZ	3x1.5mm ²	6.8mm	M 16
	3x2.5mm ²	8.2mm	M 16
	4x1.5mm ²	7.3mm	M 16
	4x2.5mm ²	9.3mm	M 20
	5x 2.5mm ²	10.2mm	M 20
	7x 2.5mm ²	11.2mm	M 25
	4x 4mm ²	10.9mm	M 25
	5x4mm ²	12.3mm	M 25
	4x6mm ²	12.9mm	M 40
	4x16mm ²	19.6mm	M 50
	4x25mm ²	23.8mm	M 50
	4x35mm ²	28.8mm	M 50
	4x50mm ²	34.9mm	M50
	4x70mm ²	42.2mm	M63
4x95mm ²	46.7mm	M63	
Type NYY-I	4x35mm ²	27.7mm	M 50
	4x50mm ²	29.8mm	M 50
	4x70mm ²	33.8mm	M 50
	4x95mm ²	38.9mm	M 63
	1x70mm ²	16.4mm	M 32
	1x95mm ²	18.5mm	M 32
	1x120mm ²	20.5mm	M 40
	1x150mm ²	22.5mm	M 40
	1x185mm ²	24.5mm	M 40
1x240mm ²	27.6mm	M 50	
Type trailing cable	2x0.75mm ² approx.	7.1mm	M16
	3G1.5mm ²	7.2mm	M16
	3G2.5mm ²	8.2mm	M16
	4G0.75mm ²	6.3mm	M16
	4G1.5mm ²	8.0mm	M16
	4G2.5mm ²	8.9mm	M20
	4G4mm ²	11.6mm	M20
	4G6mm ²	13.6mm	M25
	4G10mm ²	17.6mm	M32
	5G2.5mm ²	10.0mm	M20
	5G16mm ²	23.6mm	M40
	5G35mm ²	29.6mm	M50
	25G0.75mm ²	14.1mm	M25
5x2x0.5mm ²	10.2mm	M20	