AVENTICS

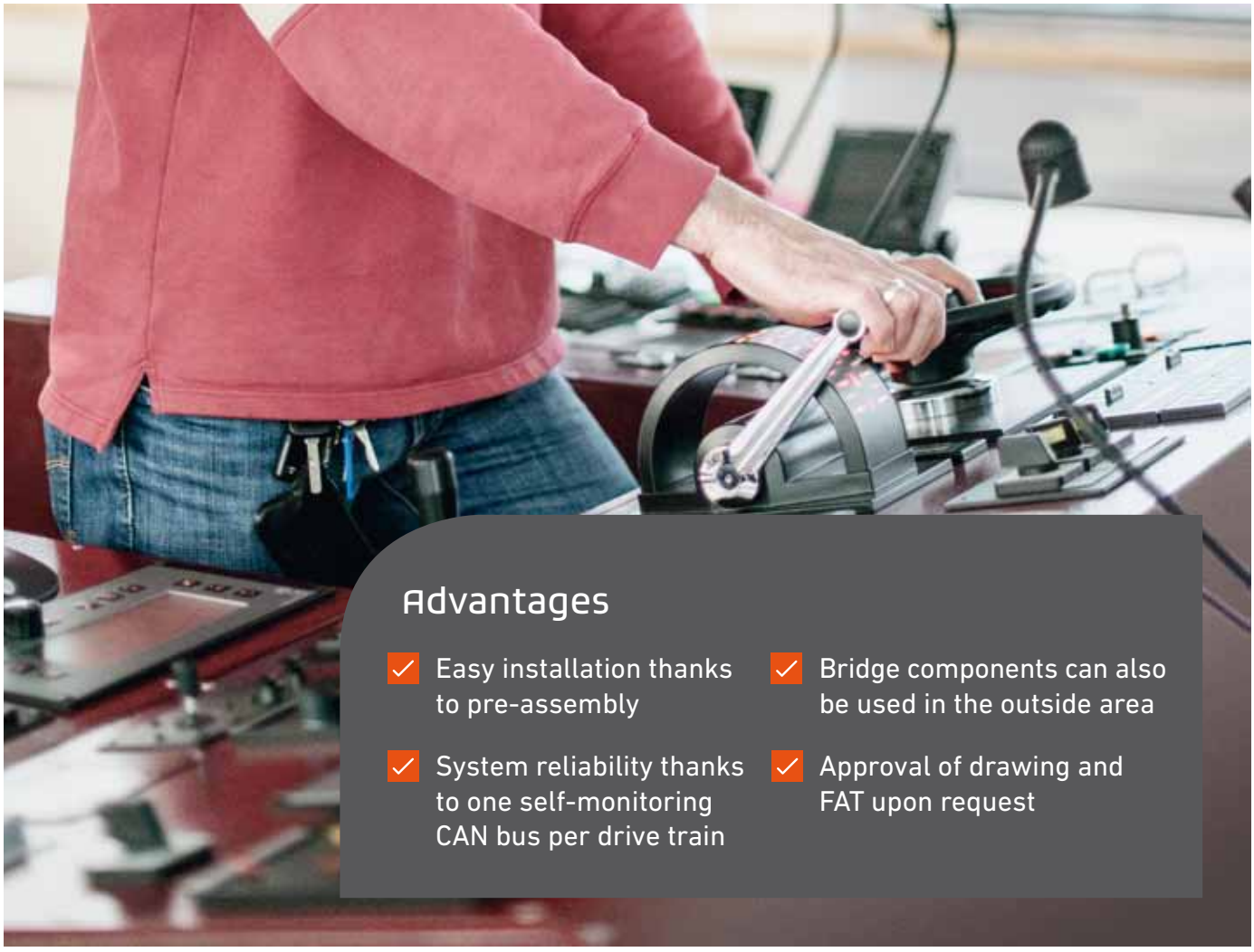
MAREX OS III
FOR A SAFE JOURNEY
CATALOG

Rexroth
Pneumatics

Ship control – let your ideas run free

AVENTICS control systems can be found on all type of ships around the world. Work vessels with classification, passenger liners, coastal cargo ships and even yachts rely on engineering expertise Made in Germany.

Regardless of which propulsion concept is required – the reversing gear system, the controllable pitch propeller system, or even new drive concepts such as hybrid systems are using our most proven product: the Marex OS III.



Advantages

- ✓ Easy installation thanks to pre-assembly
- ✓ Bridge components can also be used in the outside area
- ✓ System reliability thanks to one self-monitoring CAN bus per drive train
- ✓ Approval of drawing and FAT upon request

Marex OS III – Key Features and Advantages

Design

- Unique
- Functional
- Ergonomic

Flexible

- Modular system architecture
- Independent of the type of drive
- Easy to install

Features

- No project-based programming
- Customized by parameter settings
- Optimized operating forces

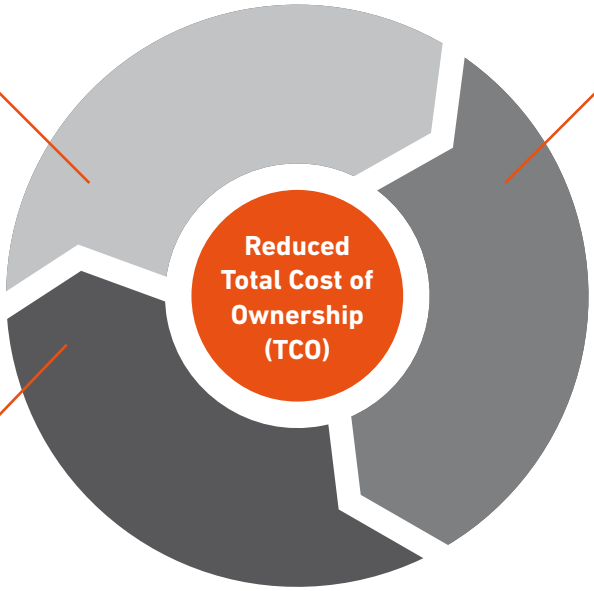
Marex OS III – Benefits

Life Cycle Management

- Consultancy during design and refit
- Commissioning and training
- Service and refitting of functions with worldwide network

Consultancy by Experts

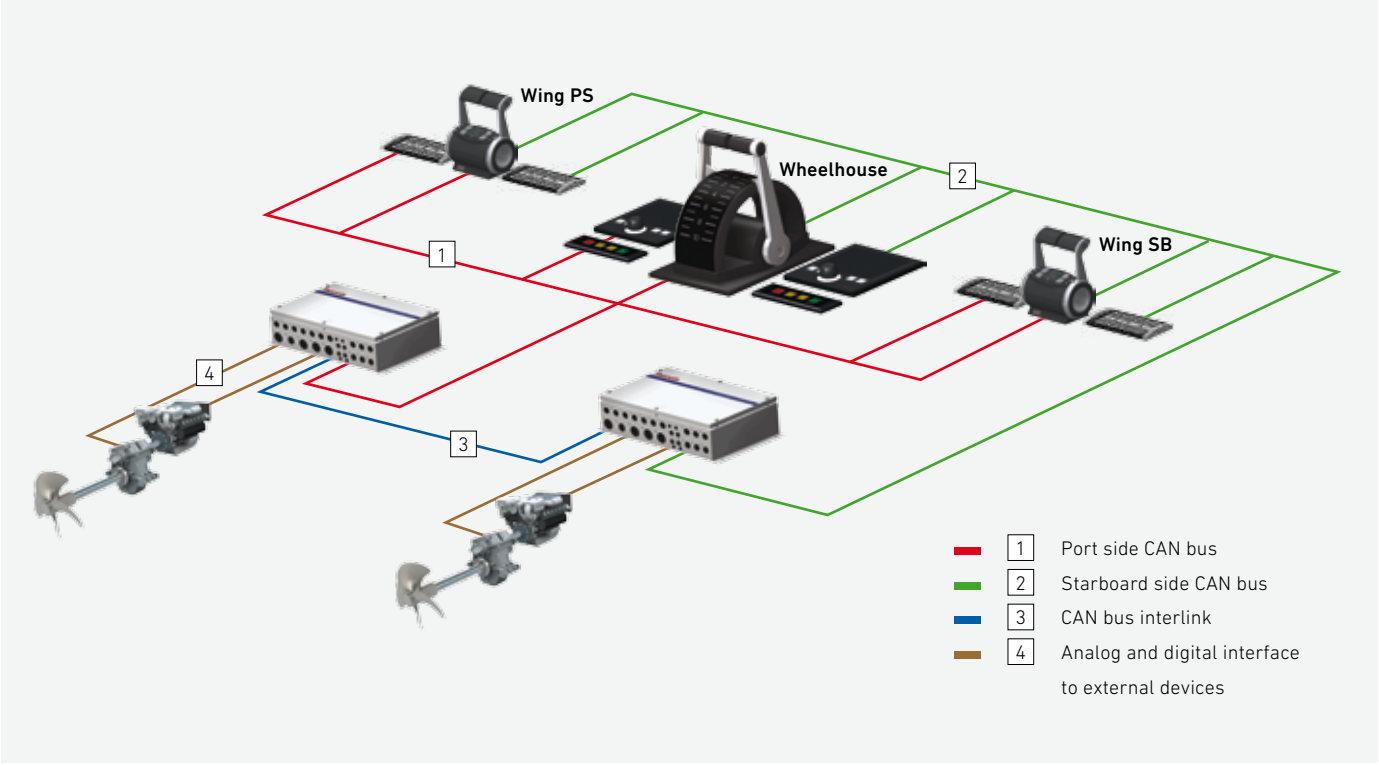
- Technical feasibility
- Project work
- Site inspection including life cycle management



Worldwide Network

- Project work
- Service
- Training
- Sales including consulting

Marex OS III – System



Integrated Functions

- Engine control, speed curves and engine stall protection
- Gear operation, reversing maneuver curves
- Control of PTO and PTI, Trolling and Slip & Grip
- Multi-engine systems
- Calculated ship speed
- Shaft brake control
- Internal software PLC to add special functions
- Standard interface for DP system, Autopilot and VDR

Marex OS III – Components

Series	Features	Pictures
Control heads	Illuminated scale, electric shaft, various designs, different propulsion plants, integrated keypad, triple-engine version available	
5.7" display	Freely configurable, 4 illuminated push buttons, digital 4-axis jog dial, readable in the sunlight, ergonomic design, 2 propulsion plants in one display	
Operating and indication modules	Indication of remote control data and data input	
Marine propulsion controllers	Single hardware component for different types of propulsion systems, preconfigured functions, software PLC function, error log with real-time stamp, integrated keypad and display	
Extension modules	VDR interface, NMEA interface, pitch controller for CPP	
Accessories	Prefabricated connecting cables and terminal blocks	
Actuators and valves	Electrical components for mechanical or pneumatic control of variables such as gear shifting, speed, or pitch setting	
Service tool	Laptop-based parameter transfer and optimization, transfer of parameters between ships within the same production line	

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Control heads

Special control heads

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Special control head systems

Operating / indication modules

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Electric accessories

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Actuators and valves

Accessories

Programming software

Control head – type 230 WILL BE REPLACED BY NEW DESIGN

Technical data

Function	Transmitting signals to the MPC for reversing gear or controllable pitch propeller propulsion systems
Supply voltage	24 V DC – 25 % / + 30 %
Nominal current consumption	24 V DC : 2.5 A
Operating temperature	-25°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	CAN bus suitable control head
Scale illumination	by LED
Scale colour	see table below
Weight	see table below

→ The control head – type 230
is designed to transmit signals to the MPC for reversing gear or controllable pitch propeller propulsion systems. Depending on the function the control heads are equipped with detents in positions O (neutral), I (ahead) and III (astern).

Type numbers – black version (scale, lever, handle and ring black)

For application (fig.)	Scale color ahead / neutral / astern	Detents in position	Number of engines / levers	Lever follow-up	Weight [kg]	Type number
Reversing gear propulsion system Fig. 1	green / yellow / red	0, I, III	1	without	3.1	362 230 001 0
				with	3.8	362 230 051 0
			2	without	3.4	362 230 101 0
				with	4.3	362 230 151 0
Controllable pitch propeller system Fig. 1	green / yellow / red	0	1	without	3.1	362 230 201 0
				with	3.8	362 230 251 0
			2	without	3.4	362 230 301 0
				with	4.3	362 230 351 0
Only speed setting system Fig. 2	- / yellow / red	0, I	1	without	3.1	362 230 401 0 *
				with	3.8	362 230 451 0 *
			2	without	3.4	362 230 501 0 *
				with	4.3	362 230 551 0 *

*on request

Type numbers – black / chrome version (scale and handle black, lever and ring chromed)

For application (fig.)	Scale colour ahead / neutral / astern	Detents in position	Number of engines / levers	Lever follow-up	Weight [kg]	Type number
Reversing gear propulsion system Fig. 1	green / yellow / red	0, I, III	1	without	3.1	362 230 002 0
				with	3.8	362 230 052 0
			2	without	3.4	362 230 102 0
				with	4.3	362 230 152 0
Controllable pitch propeller system Fig. 1	green / yellow / red	0	1	without	3.1	362 230 202 0
				with	3.8	362 230 252 0
			2	without	3.4	362 230 302 0
				with	4.3	362 230 352 0
Only speed setting system Fig. 2	- / yellow / red	0, I	1	without	3.1	362 230 402 0 *
				with	3.8	362 230 452 0 *
			2	without	3.4	362 230 502 0 *
				with	4.3	362 230 552 0 *

*on request

Accessories

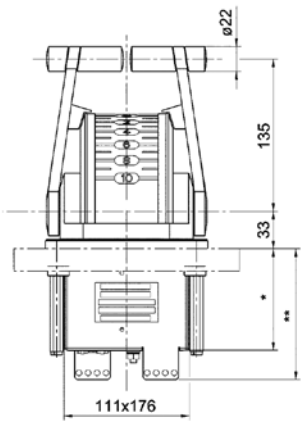
Device	Description	Type number
Main board	electronic board*	on request
Mechanical spare parts	break-unit, lever, handle	on request
Electronic spare parts	potentiometer	on request

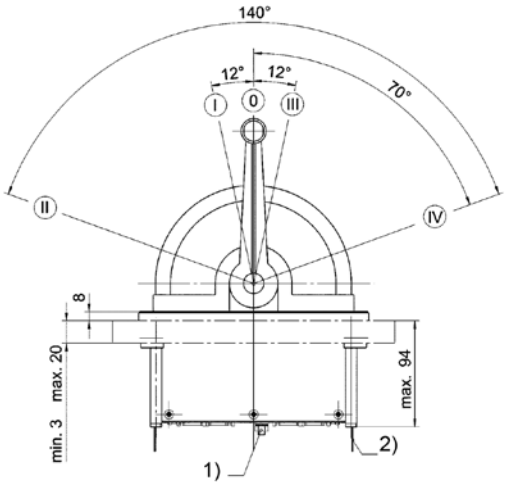
* software version and version of printed circuit board are needed

Control head – type 230 WILL BE REPLACED BY NEW DESIGN

Technical drawing

fig. 1





top view fig. 1

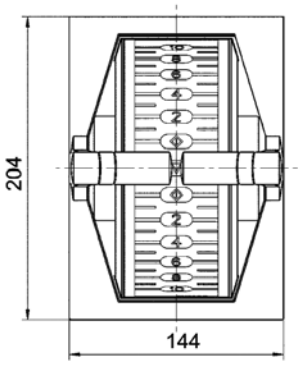
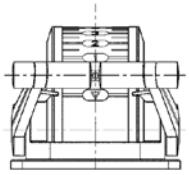
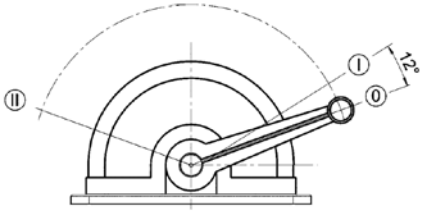
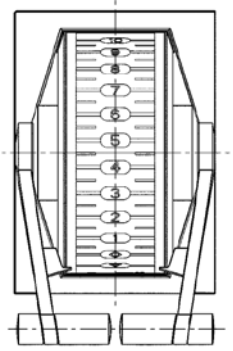


fig. 2



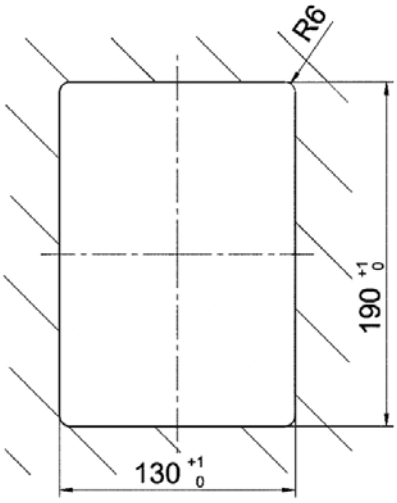


top view fig. 2



1. static bonding connection, 2. traction relief for cable of supply voltage
* without lever follow-up 90 mm, with lever follow-up 155 mm
** without lever follow-up 116 mm, with lever follow-up 181 mm

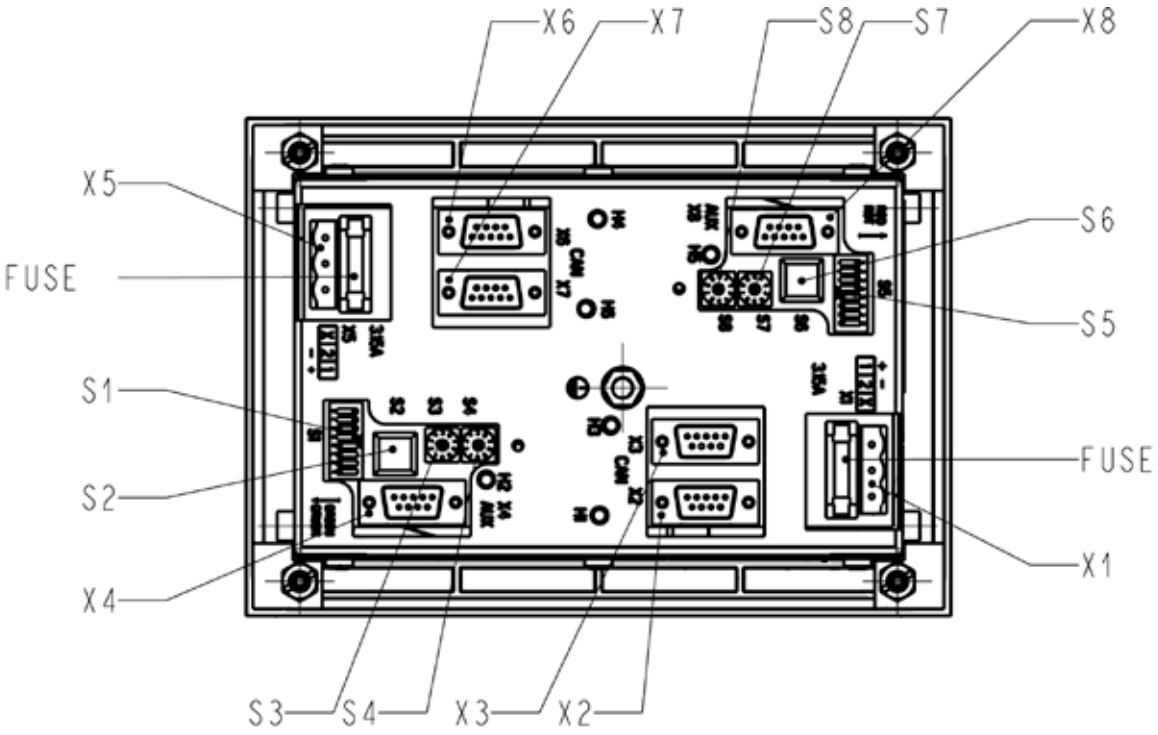
Panel cutout



Control head – type 230 WILL BE REPLACED BY NEW DESIGN

Pin assignment

Bottom view of twin control head



Connection	Description
X1, X5*	connector power supply
X2, X6*	connector CAN-bus input
X3, X7*	connector CAN-bus output
X4, X8*	connector operating / indication module
S1, S2, S5*, S6*	special operation
S3, S4, S7*, S8*	CAN-bus address

*only on control heads with two levers

Control head – type 230

Technical data

Function	Transmitting signals to the MPC for reversing gear or controllable pitch propeller propulsion systems
Supply voltage	24 V DC – 25 % / + 30 %
Nominal current consumption	24 V DC : 2×1,4 A
Operating temperature	-20°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	CAN bus suitable control head
Scale illumination	by LED
Scale colour	see table below
Weight	see table below

→ The control head – type 230
is designed to transmit signals to the MPC for reversing gear or controllable pitch propeller propulsion systems. Depending on the function the control heads are equipped with detents in positions O (neutral), I (ahead) and III (astern).

Type numbers – black version (scale, lever, handle and ring black)

For application (fig.)	Scale color ahead / neutral / astern	Detents in position	Number of engines / levers	Lever follow-up	Weight [kg]	Type number
Reversing gear propulsion system Fig.1	green / yellow / red	0, I, III	1	without	3.4	R417 002 068
				with	4.2	R417 002 080
			2	without	3.6	R417 002 070
				with	4.9	R417 002 082
Controllable pitch propeller system Fig. 2	green / yellow / red	0	1	without	3.4	R417 002 072
				with	4.2	R417 002 084
			2	without	3.6	R417 002 074
				with	4.9	R417 002 086
Only speed setting system Fig.3	- / yellow / red	I	1	without	3.4	R417 002 076*
				with	4.2	R417 002 088*
			2	without	3.6	R417 002 078*
				with	4.9	R417 002 090*

*on request

Type numbers – black / chrome version (scale and handle black, lever and ring black or chromed)

For application (fig.)	Scale color ahead / neutral / astern	Detents in position	Number of engines / levers	Lever follow-up	Weight [kg]	Type number
Reversing gear propulsion system Fig.1	green / yellow / red	0, I, III	1	without	3.5	R417 002 069
				with	4.3	R417 002 081
			2	without	3.7	R417 002 071
				with	5.0	R417 002 083
Controllable pitch propeller system Fig. 2	green / yellow / red	0	1	without	3.5	R417 002 073
				with	4.3	R417 002 085
			2	without	3.7	R417 002 075
				with	5.0	R417 002 087
Only speed setting system Fig.3	- / yellow / red	I	1	without	3.5	R417 002 077*
				with	4.3	R417 002 089*
			2	without	3.7	R417 002 079*
				with	5.0	R417 002 091*

*on request

Accessories

Device	Description	Type number
Main board	Electronic board**	on request
Mechanical spare parts	Break-unit, lever, handle	on request
Electronic spare parts	Potentiometer	on request

** software version and version of printed circuit board are needed

Control head – type 230

Technical drawing

Fig. 1

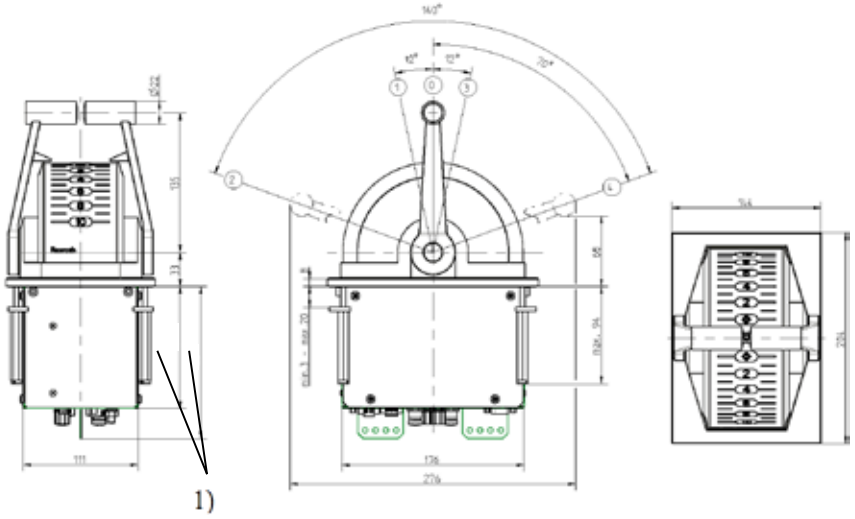


Fig. 2

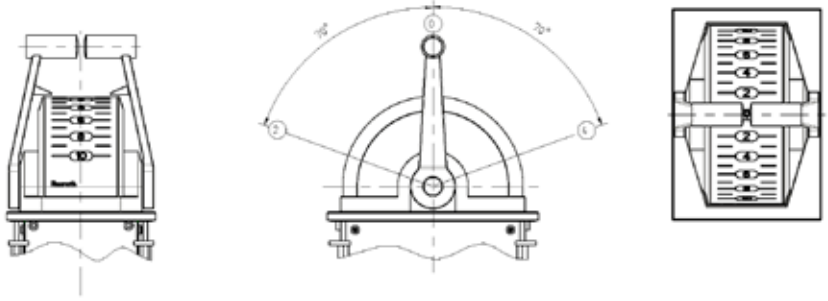
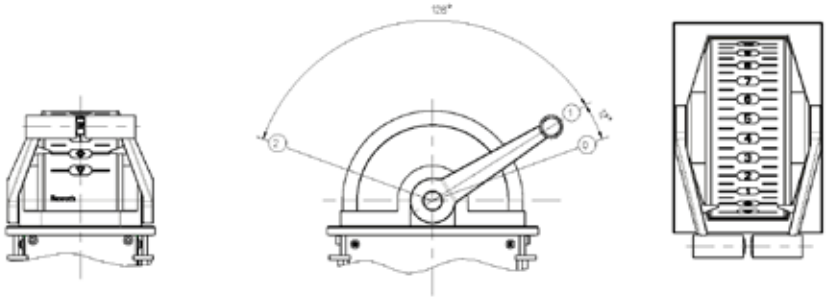
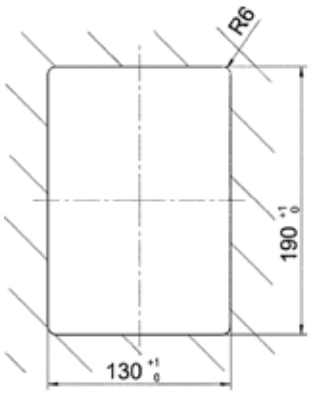


Fig. 3



1) without lever follow-up 118 mm, with lever follow-up 147 mm

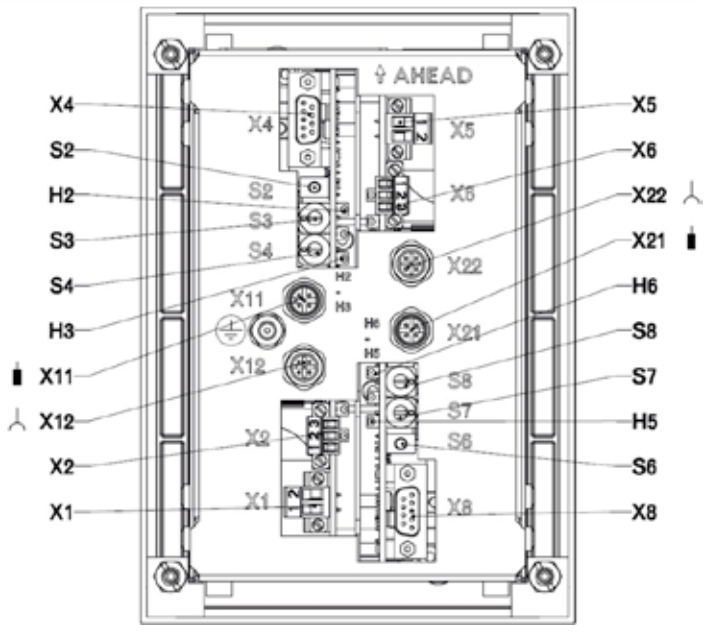
Panel cutout



Control head – type 230

Pin assignment

Bottom view of twin control head



Connection	Description
X1, X5*	Connector power supply 24 V DC
X2, X6*	Binary input
X11, X21*	CAN in- / output
X12, X22*	CAN out- / input
X4, X8*	Connector I^2C-bus
S4, S3, S8*, S7*	CAN-bus address
S2, S6*	Special operation
H3, H6*	CAN-bus status
H2, H5*	Power supply status

*only on control heads with two levers

Control head – type 240

Technical data

Function	Transmitting signals to the MPC for reversing gear propulsion system
Operating temperature	-25°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	CAN bus suitable control head
Indication	by LED and buzzer
Weight	see table below

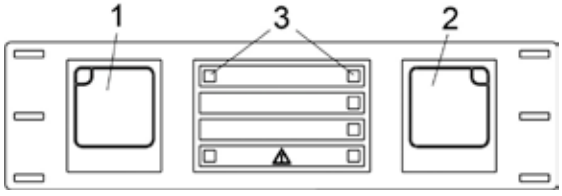
→ The control head – type 240
is designed to transmit signals to the MPC for reversing gear propulsion system. Depending on the function the control heads are equipped with detents in positions O (neutral), I (ahead) and II (astern). Integrated in the control head is a operating and indication panel.

Type numbers

Device	For application	Special	Number of engines / levers	Lever	Weight [kg]	Type number
Control head – type 240	Reversing gear propulsion system	-	1	standard	1.4	362 240 160 0
				short	1.4	R417 000 828
			2	standard	1.4	362 240 060 0
				short	1.4	R417 000 610
			3	standard	2.6	R417 001 073
		scale points (0-10)	1	standard	1.4	on request
				short	1.4	on request
			2	standard	1.4	R417 000 760
				short	1.4	R417 002 277

Functions

Type number	Push button 1 for	Push button 2 for	Indication 3 for	Figure
362 240 160 0 362 240 060 0 R417 000 828 R417 000 610 R417 001 073	station transfer, warming up	synchronization or trolling	command active, synchronization, trolling, alarm	1
R417 000 760 R417 002 277	station transfer, warming up	synchronization or trolling	command active, synchronization, trolling, alarm	2



Accessories

Device	Type number
Spare parts	on request

Panel layout

Figure 1

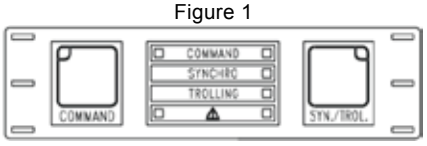
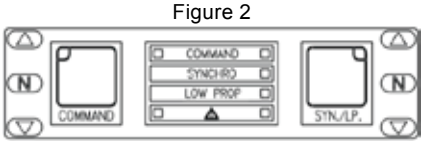
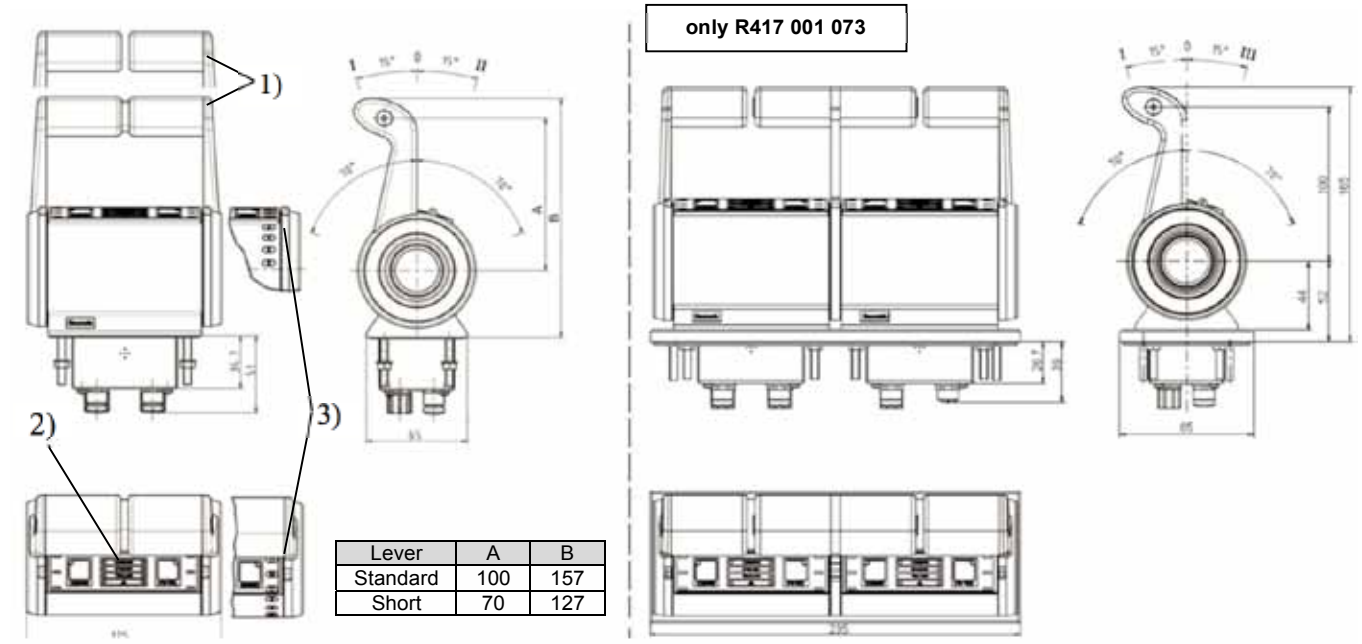


Figure 2



Control head – type 240

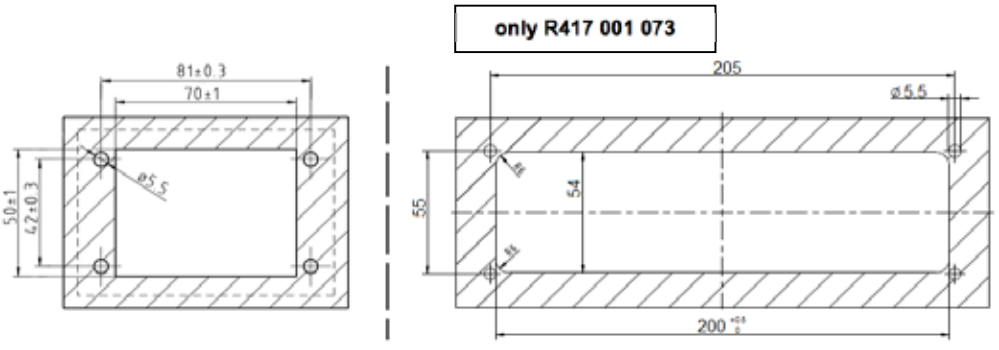
Technical drawing



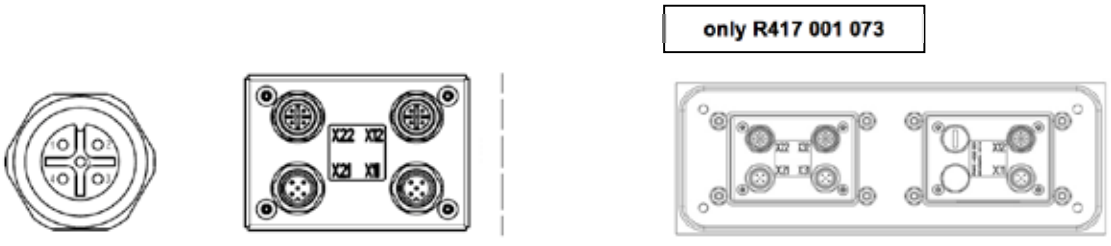
Lever	A	B
Standard	100	157
Short	70	127

1) see table “number of levers”, 2) see table “panel layouts”, 3) housing modification for figure 2

Panel cutout



Pin assignment



Connection	Description
1	Operating voltage 0 V
2	Operating voltage +38 V
3	0 V
4	CAN-H
5	CAN-L
X11, X21*, X31**	CAN input / output
X12, X22*, X32**	CAN output / input

* only on control head with two levers, ** only R417 001 073

Control head – type 240 night design

Technical data

Function	Transmitting signals to the MPC for single-engine and double-engine propulsions
Operating temperature	-25°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	CAN bus suitable control head
Indication	by LED and buzzer
Weight	see table below

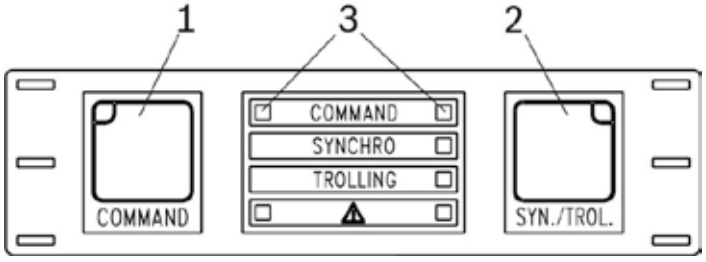
→ The control head – type 240 night design
is designed for gear switch and speed setting for single- and double-engine propulsion system. Depending on the function the control heads are equipped with detents in positions O (neutral), I (ahead) and II (astern). Integrated in the control head is a operating and indication panel. The control head has a lighted keypad.

Type numbers

Device	Description	Number of engines / levers	Lever	Weight [kg]	Type number
Control head – type 240 night design	Single-engine propulsion system	1	standard	1.4	R417 000 975
			short	1,4	R417 002 245
	Double-engine propulsion system	2	standard	1,4	R417 000 966
			short	1.4	R417 000 977

Functions

Push button 1 for	Push button 2 for	Indication 3 for
station transfer, warming up	synchronization or trolling	command active, synchronization, trolling, alarm

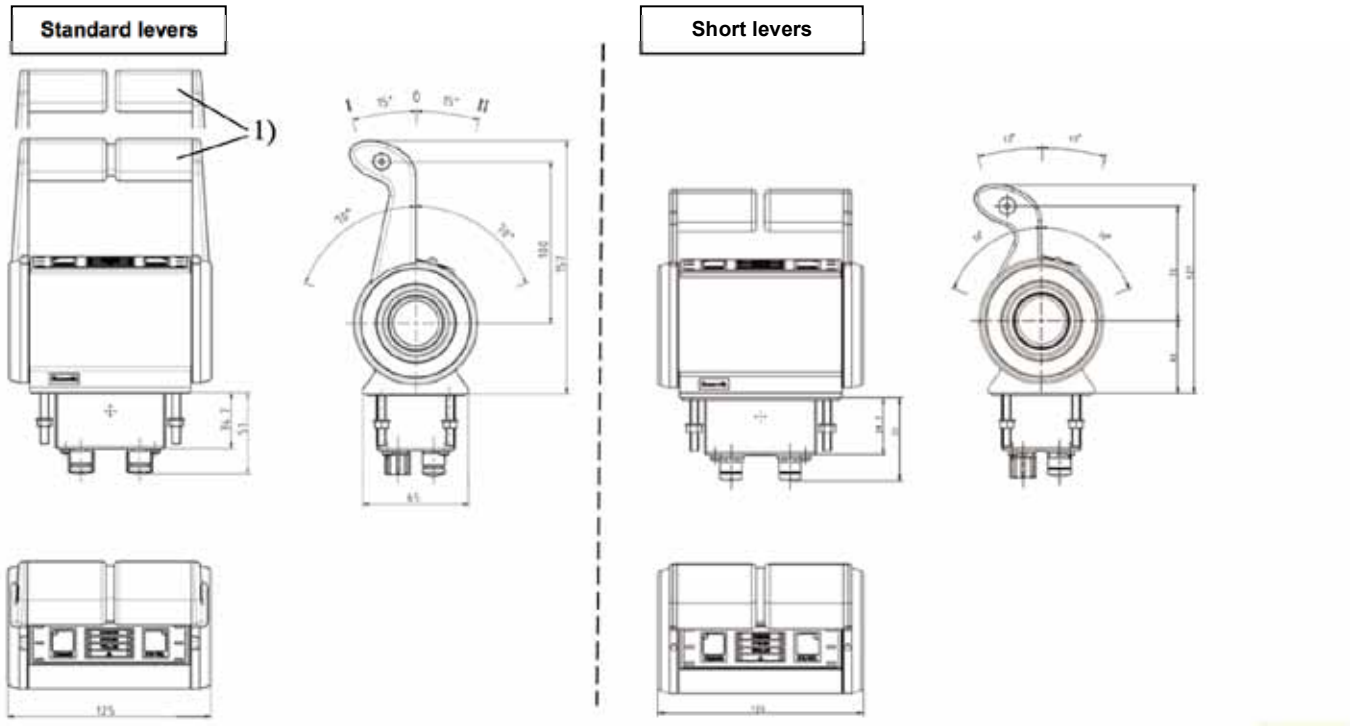


Accessories

Device	Type number
Spare parts	on request

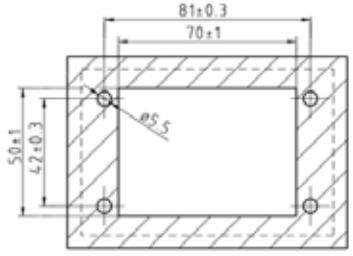
Control head – type 240 night design

Technical drawing

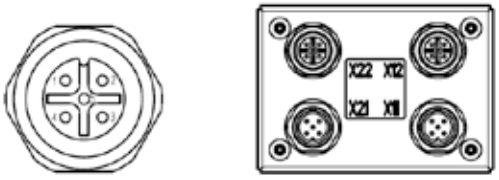


1) see table “number of levers”

Panel cutout



Pin assignment



Connection	Description
1	Operating voltage 0 V
2	Operating voltage +38 V
3	0 V
4	CAN-H
5	CAN-L
X11, X21	CAN in- / output
X12, X22	CAN out- / input

Control head – type 241

Technical data

Function	Transmitting signals to the MPC for reversing gear or controllable pitch propeller propulsion system
Operating temperature	-25°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	CAN bus suitable control head
Indication	by LED and buzzer
Weight	see table below

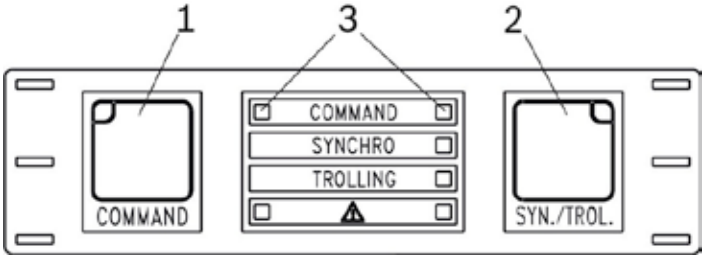
→ The control head – type 241
is designed to transmit signals to the MPC for reversing gear propulsion system. The control heads are equipped with detents in positions O (neutral), I (ahead) and II (astern). Integrated in the control head is an operating and indication panel.

Type numbers

Device	For application	Number of engines / levers	Weight [kg]	Type number
Control head – type 241	reversing gear propulsion system	1	1.4	R417 000 357
		2	1.4	R417 000 356

Functions

Type number	Push button 1 for	Push button 2 for	Indication 3 for
R417 000 357	station transfer, warming up	synchronization or trolling	command active, synchronization, trolling, alarm
R417 000 356			

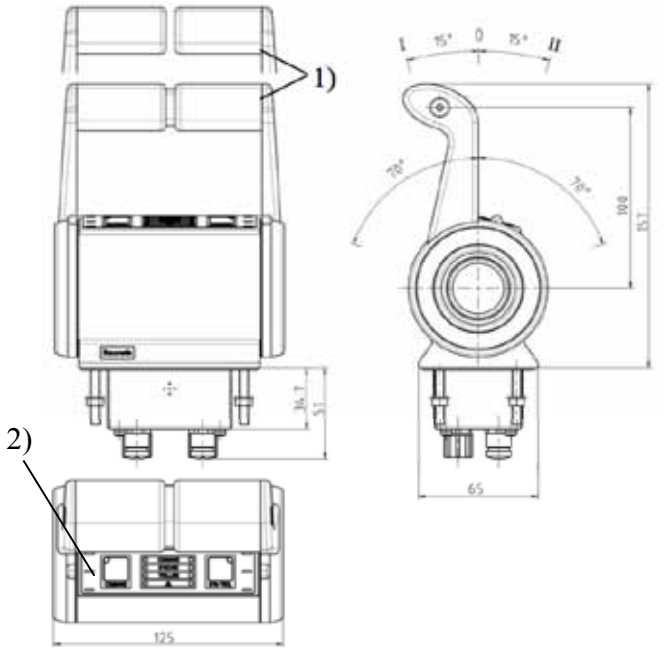


Accessories

Device	Type number
Spare parts	on request

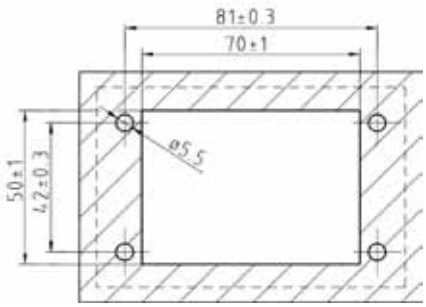
Control head – type 241

Technical drawing

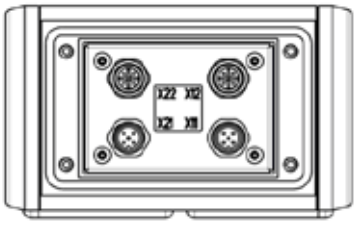


1) see table “number of levers”, 2) see table “panel layouts”

Panel cutout



Pin assignment



Connection	Description
1	Operating voltage 0 V
2	Operating voltage +38 V
3	0 V
4	CAN-H
5	CAN-L
X11, X21*	CAN in- / output
X12, X22*	CAN out- / input

* only on control head with two levers

Control head – type 244

Technical data

Function	Transmitting signals to the MPC for reversing gear propulsion system
Operating temperature	-25°C to +70°C
Protection category	IP66 acc. to IEC 60529
Design	CAN bus suitable control head
Indication	by LED and buzzer
Weight	see table below

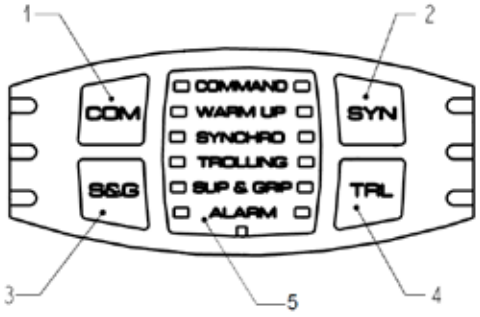
➔ The control head – type 244
is designed to transmit signals to the MPC for reversing gear propulsion system. The control heads are equipped with detents in positions O (neutral), I (ahead) and II (astern). Integrated in the control head is a operating and indication panel.

Type numbers

Device	For application	Number of engines / levers	Lever	Weight [kg]	Type number
Control head – type 244	reversing gear propulsion system	2	standard	1.4	R417 001 230
		3	standard	2.6	R417 001 350
		2	short	1,4	R417 001 130

Functions

Type number	Push button 1 for	Push button 2 for	Push button 3 for	Push button 4 for	Indication 5 for
R417 001 230 R417 001 350 R417 001 130	station transfer, warming up	synchronization	slip&grip	trolling	command active, warm up, synchronization, trolling, slip&grip, alarm

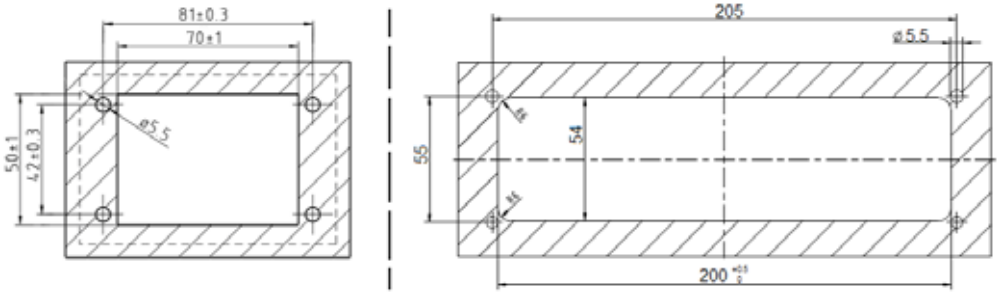


Accessories

Device	Type number
Spare parts	on request

Panel cutout

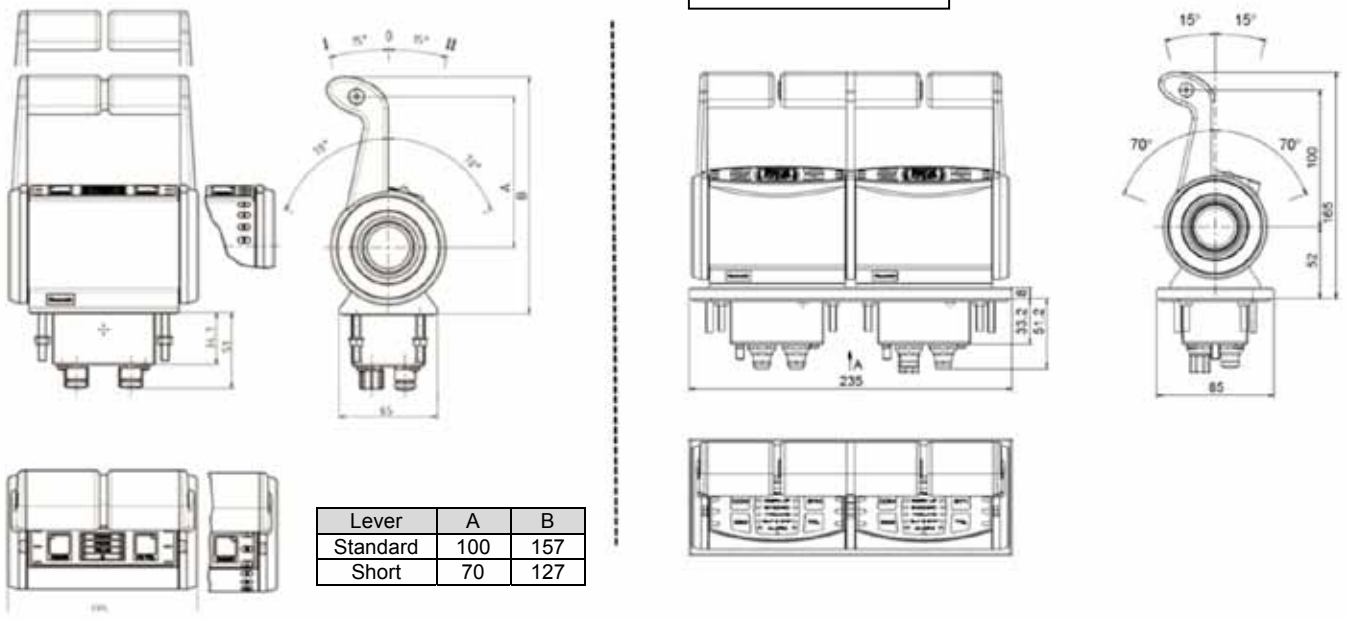
only R417 001 350



Control head – type 244

Technical drawing

only R417 001 350



Lever	A	B
Standard	100	157
Short	70	127

Pin assignment

only R417 001 350

Connection	Description
1	Operating voltage 0 V
2	Operating voltage +38 V
3	0 V
4	CAN-H
5	CAN-L
X11, X21, X31*	CAN in- / output
X12, X22, X32*	CAN out- / input

* only R417 001 350

Control head – type 240 without electronics

Technical data

Function	Transmitting signals to the CAN I/O light for pitch propeller system
Operating temperature	-25°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	CAN bus suitable control head
Weight	see table below

→ The control head – type 240 without electronics
is designed for controllable pitch propeller system. The control heads are equipped with detents in positions neutral.

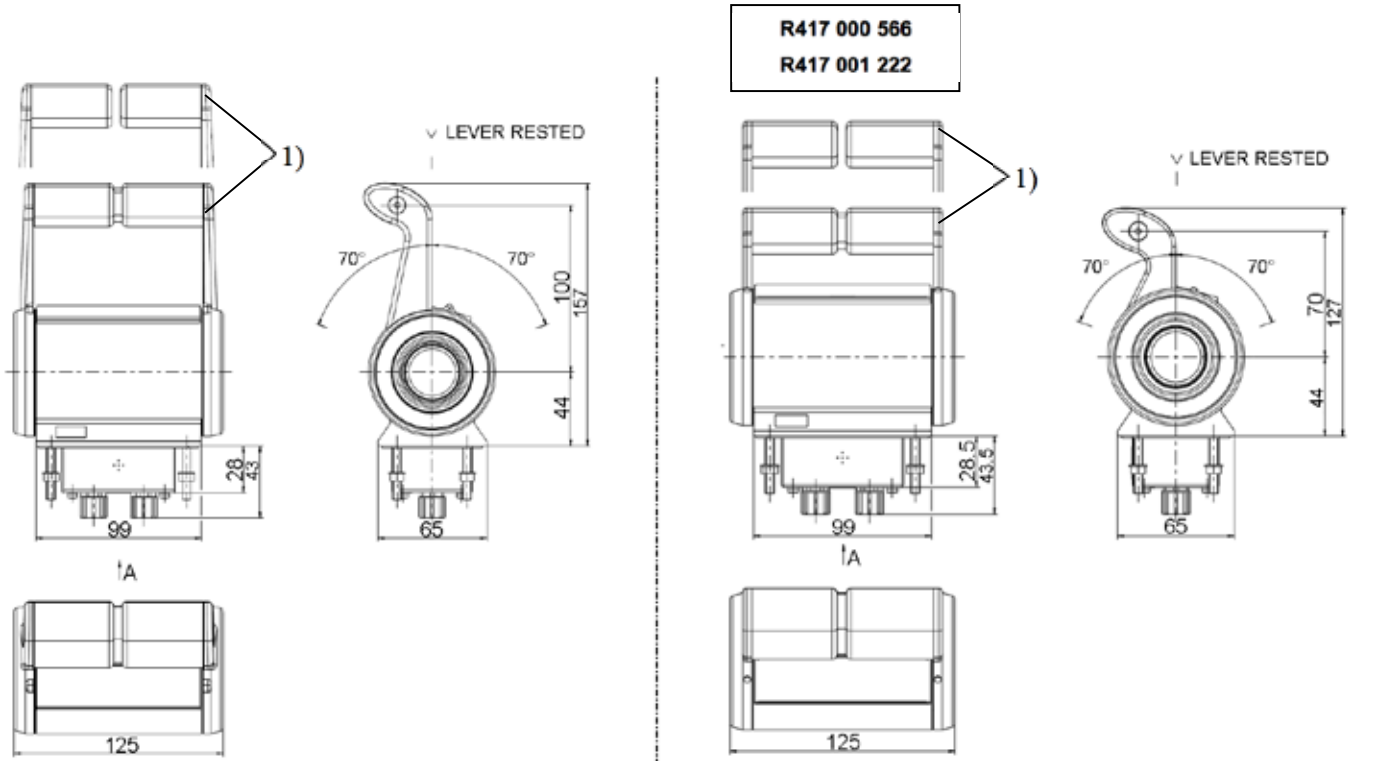
Type numbers

Device	For application	Number of engines / levers	Lever	Weight [kg]	Type number
Control head – type 240 without electronics	controllable pitch propeller system	1	standard	1.2	362 240 150 0
			short	1.2	R417 000 566
		2	standard	1.2	362 240 050 0
			short	1.2	R417 001 222

Accessories

Device	Type number
Spare parts	on request

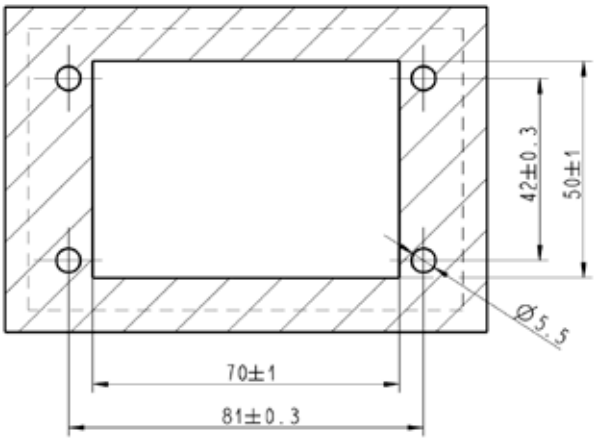
Technical drawing



1) see table “number of levers”

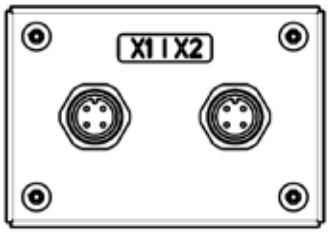
Control head – type 240 without electronics

Panel cutout



* only on control head with two levers

Pin assignment



Connection	Description
1	Operating voltage +5 V DC
2	Operating voltage 0 V
3	Signal potentiometer 2
4	Signal potentiometer 1
X1	Potentiometer-double / * potentiometer-double SB
X2	Not allocated / *potentiometer-double PS

CAN-I/O light type 230

Technical data

Function	Control unit for propulsion systems
Supply voltage	24 V DC -25% / +30% 12 V DC -20% / +30%
Nominal current consumption	24 V : 1.4 A 12 V : 2.8 A
Fuse	10 A (T)
Operating temperature	-20°C to +70°C
Relative humidity	95%
Vibration solidity	4g, (2 … 100Hz), IEC 60068-2-6, test Fc
Isolation strength	500 V AC
Applied EMC standards	EN 60945:2002
Protection category	IP20 acc. to IEC 60529
Housing	stainless steel
Weight	1,2 kg

→ The CAN-I/O light type 230
is designed for reading of potentiometer values or current values from control levers and operating modules. Operating modules and bargraphs of type 231 can be connected to the CAN-I/O.

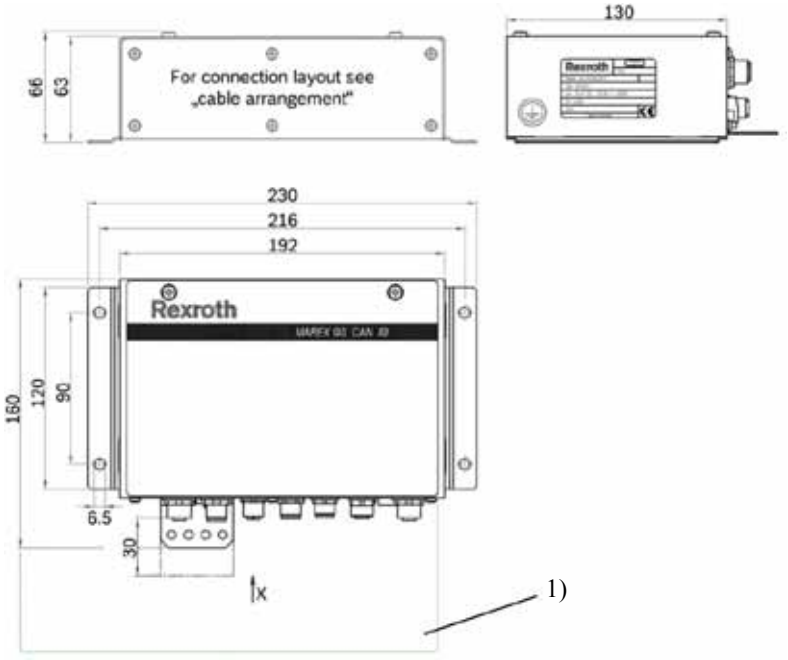
Type numbers

Device	Type number
CAN-I/O light type 230	R419 300 376

Accessories

Device	Type number
Connection cables	see separate page
Dummy plug for potentiometer, 10 kOhm	see separate page
Control lever, type 240, reversing gear, short levers	see separate page
Joystick, type 400, 2 axes, detent in neutral	see separate page

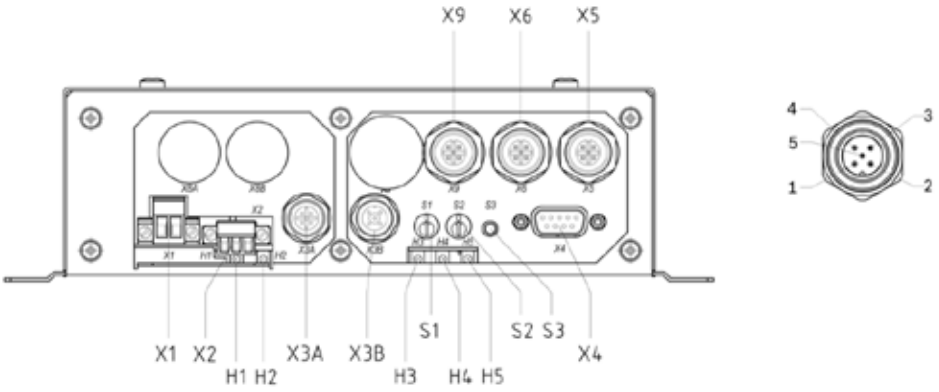
Technical drawing



Mounting position is optional, preferably as drawn.
1) Please provide additional space for wiring in the area of the M12-Connectors 80 mm and the cable clamps 30 mm.

CAN-I/O light type 230

Terminal assignment



Connection	Description
X1	+12V or +24V power supply
X2	Digital inputs
X3A, B	CAN 1
X4	I^2C bus
X5	SG3 analog signals: 0…5 kΩ*
X6	SG2 analog signals: 0…5 kΩ*
X9	SG1 analog signals: 0…5 kΩ*
H1	LED / digital inputs
H2	LED / digital inputs
H3	LED / CAN 1
H4	N.c.
H5	LED / 5V supply
S1	CAN ID tenth digits
S2	CAN ID unit digits
S3	Parameter push-button
1	+5 V DC
2	GND
3	Signal
4	N.c.
5	N.c.

*) 0 kΩ and 5 kΩ signals correspond to the two extreme positions of the lever (-100% and +100 %)

Hand-held remote control for reversing gear application – type 250

Technical data

Funktion		Hand-held remote control (independent of position) for water crafts, in particular motorboats
Supply voltage		24 V DC -25% / +30% 12 V DC -25% / +30%
Nominal current consumption		24 V : 1 A 12 V : 2 A
Fuse		4 A (T) supply voltage (K7) 4 A (T) safety stop
Operating temperature		-20°C to +70°C
Vibration solidity		0.7 g (5 ... 100 Hz); EN/IEC 60068-2-6
Applied EMV standards		EN 60945; Germanischer Lloyd (2003); Lloyds Register (2002)
Protection type	Hand-held	IP66
	Control unit	IP54 acc. to IEC 60529 (DIN VDE 0470)
Housing		stainless steel
Weight		see table below

→ The hand-held remote control for reversing gear application
is designed to transmit signals to the MPC for reversing gear. The control head is equipped with detents in positions O (neutral), I (ahead) and II (astern). Integrated in the control head is an operating and indication panel.

Type numbers

Device	Description	Weight [kg]	Type number
Hand-held remote control system	Consists of: hand-held remote unit, control unit and connecting cable 20 m + plug	app. 8.88	R419 300 137

Spare parts

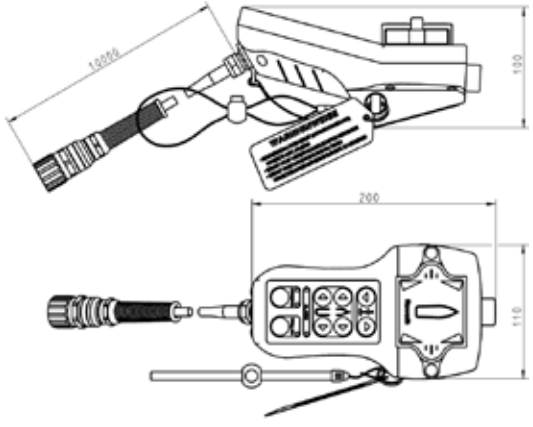
Device	Weight [kg]	Type number
Hand-held remote unit	0.56	362 250 100 0
Control unit	6.4	R419 300 132
Connecting cable 20 m + plug	1.93	894 620 194 2

Accessories

Device	Description	Type number
Hand-held dispatcher	To connect additional terminal	R419 300 455
CAN bus cable M12		see page “cable equipped with M12 plugs”
Wall-mounting fixture for hand-held		R417 000 347

Technical drawing and pin assignment

362 250 100 0

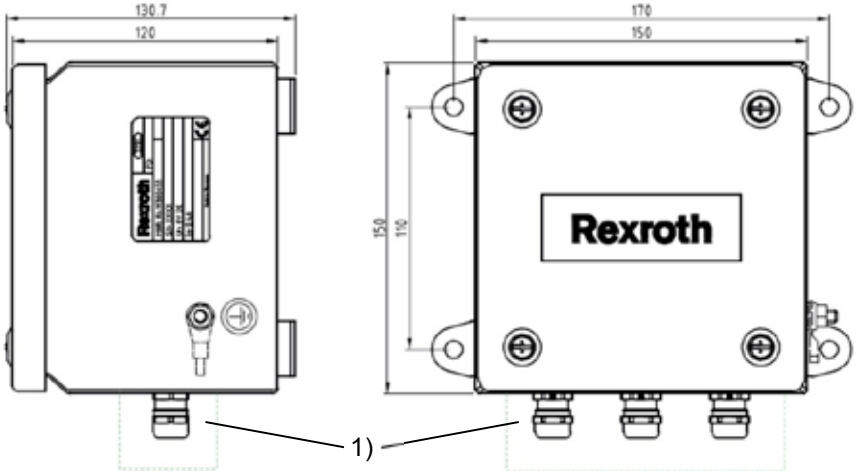


Pin	Description
1	0 V
2	8 V
3	CAN high
4	CAN low
5	Safety stop +
6	Safety stop -
7	Connected with pin 1

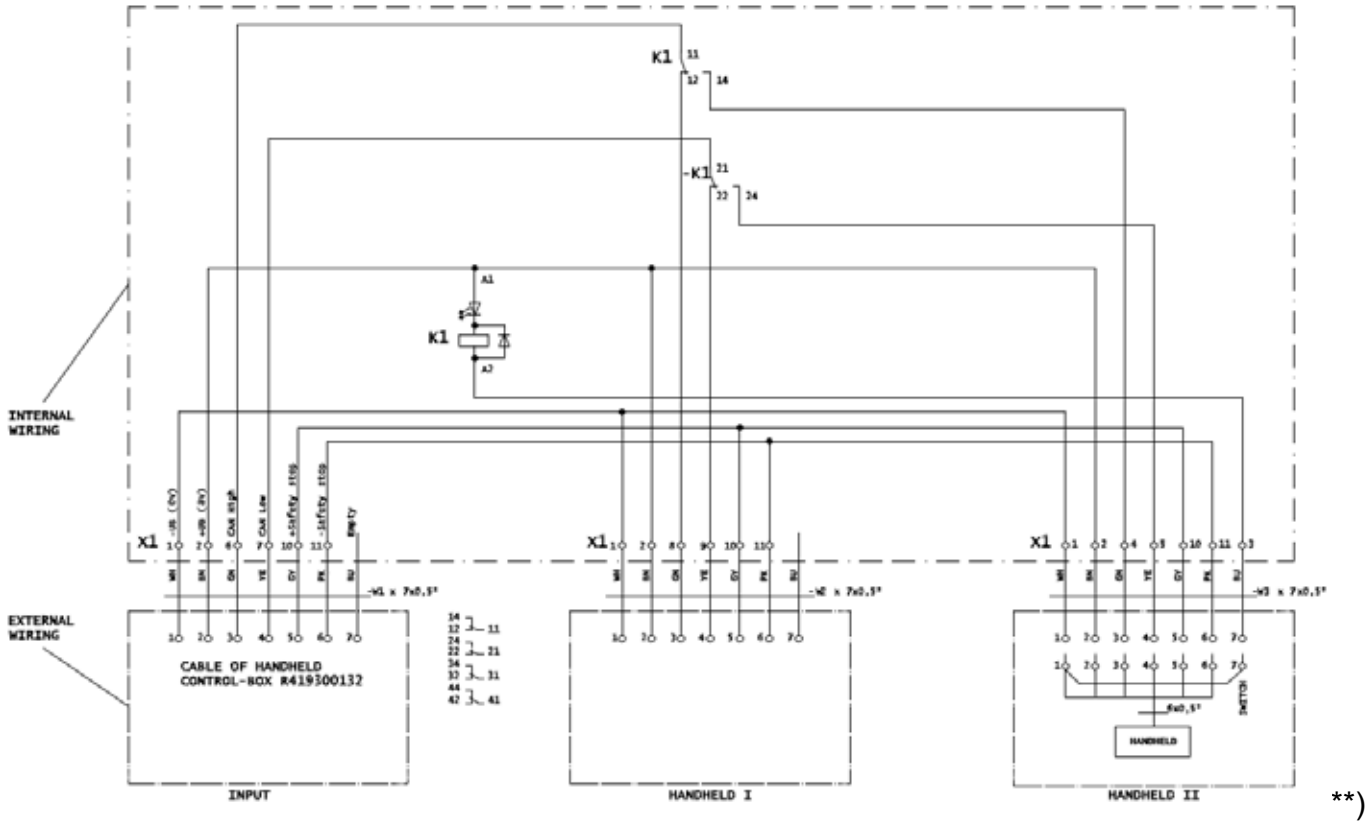
Hand-held remote control for reversing gear application – type 250

Technical drawing and pin assignment

R419 300 455



1) please provide additional space for wiring in the area of the connections as shown in the figure



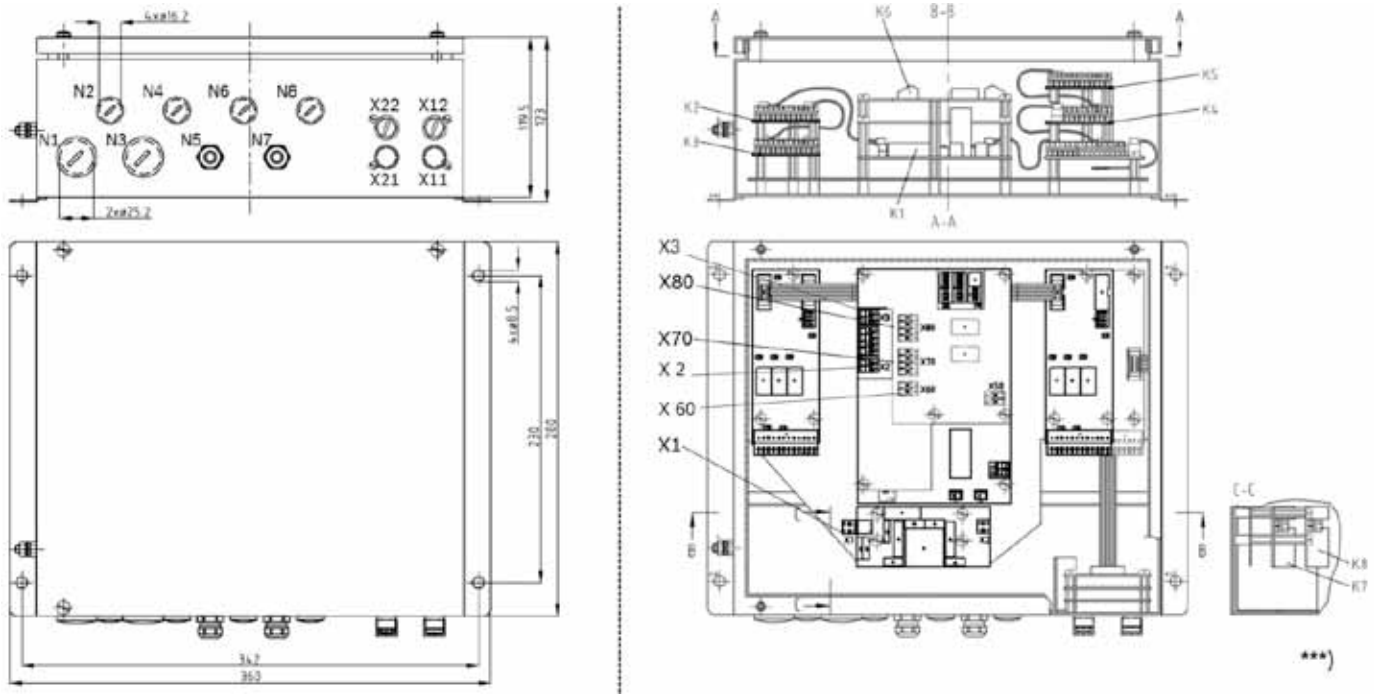
**)

** only 1 handheld at the same time could be plugged in
maximum length of cable between handheld control box and handheld I resp. handheld II is 30 m

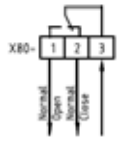
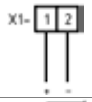
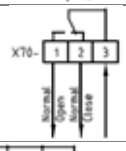
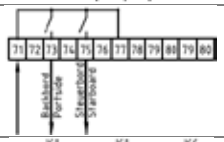
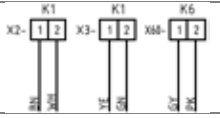
Hand-held remote control for reversing gear application – type 250

Technical drawing and pin assignment

R419 300 132



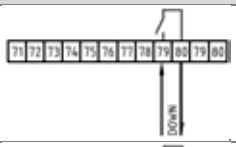
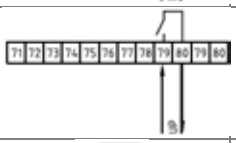
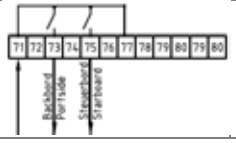
*** please provide additional space for parameterizing of device

Connection	Pin-group	Board	Function		Description
N1	X80	K6		safety stop output portside	switching voltage 32 V DC current on contact 2 A DC (min. 10 mA DC)
N2	X1	K8		safety stop power supply	24 V DC -25% / +30% 12 V DC -25% / +30%
N3	X70	K6		safety stop output starboard	switching voltage 32 V DC current on contact 2 A DC (min. 10 mA DC)
N4	K3			bow thruster	switching voltage 32 V DC current on contact 2 A DC (min. 10 mA DC)
N5	X2, X3, X60	K1 / K6		hand held	

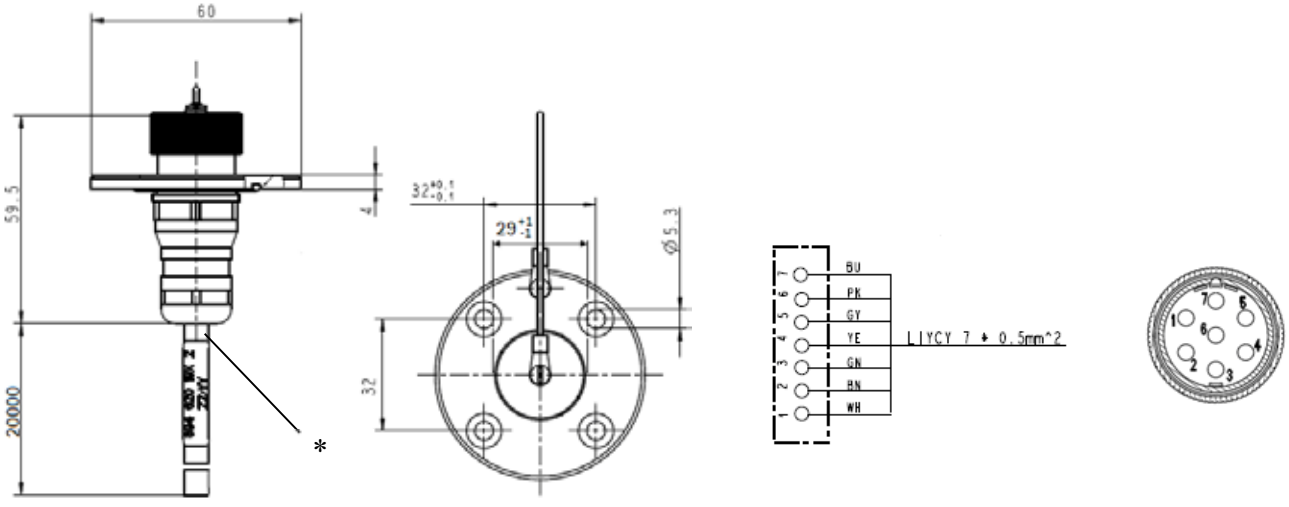
Hand-held remote control for reversing gear application – type 250

Technical drawing and pin assignment

R419 300 132

Connection	Pin-group	Board	Function	Description
N6	K5		 anchor winch	switching voltage 32 V DC current on contact 2 A DC (min. 10 mA DC)
	K3		 anchor winch	switching voltage 32 V DC current on contact 2 A DC (min. 10 mA DC)
N7	X1	K7	 supply voltage	24 V DC -25% / +30% 12 V DC -25% / +30%
N8	-	K5	 stern thruster	switching voltage 32 V DC current on contact 2 A DC (min. 10 mA DC)
X11 / X12	CAN-Bus in-/outputs starboard			
X21 / X22	CAN-Bus in-/outputs portside			

894 620 194 2



* please provide additional space for wiring in the area of the cable connector 80 mm

Control head system – type 251 – Palm Beach

Technical data

Design	CAN bus suitable control head system
Operating temperature	-25°C to +70°C
Weight	see table
Power supply	via CAN-bus cable
Protection	IP66 acc. to IEC 529 (DINVDE 0470)

→ The control head – type 251
is transmitting signals to the MPC for reversing gear propulsion systems with detents in positions O (neutral), I (ahead) and II (astern).

Type numbers

Device	Figure	Special	Number of engines / levers	Weight [kg]	Type number
Control head system 251*	1	2 × control head type 251 1 × control unit type 251 2 × cable M12, 2m	2/ 2*	5,1 kg	R417 001 064
Control head type 251*	2	-			R417 001 067
Operating and indication module type 251	3	-			R417 000 215

*handle for control head has to be ordered separately

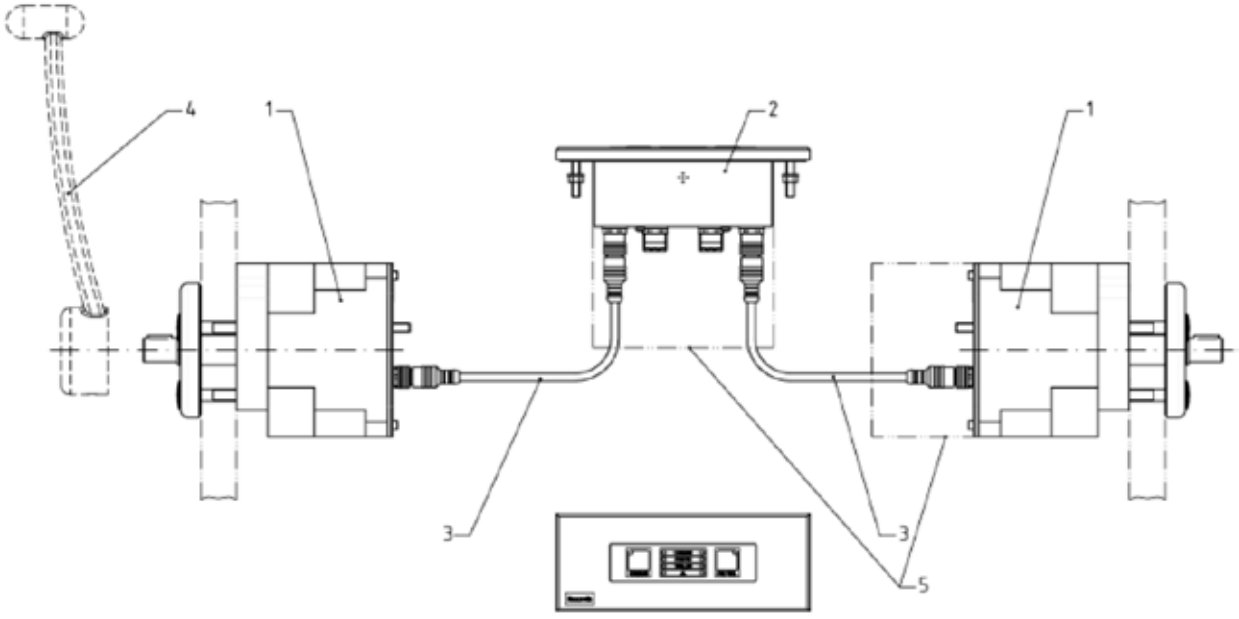
Accessories

Device	Figure	Description	Type number
Handle	4	Handle for control head type 251	R417 000 107
Handle	4	Handle for control head type 251 with buttons	R431 001 441
Cable	-	Cable to connect the control head to the operation module	R419 800 155

Spare parts

Device	Description	Type number
Spare parts	-	on request

Figure 1 – system overview

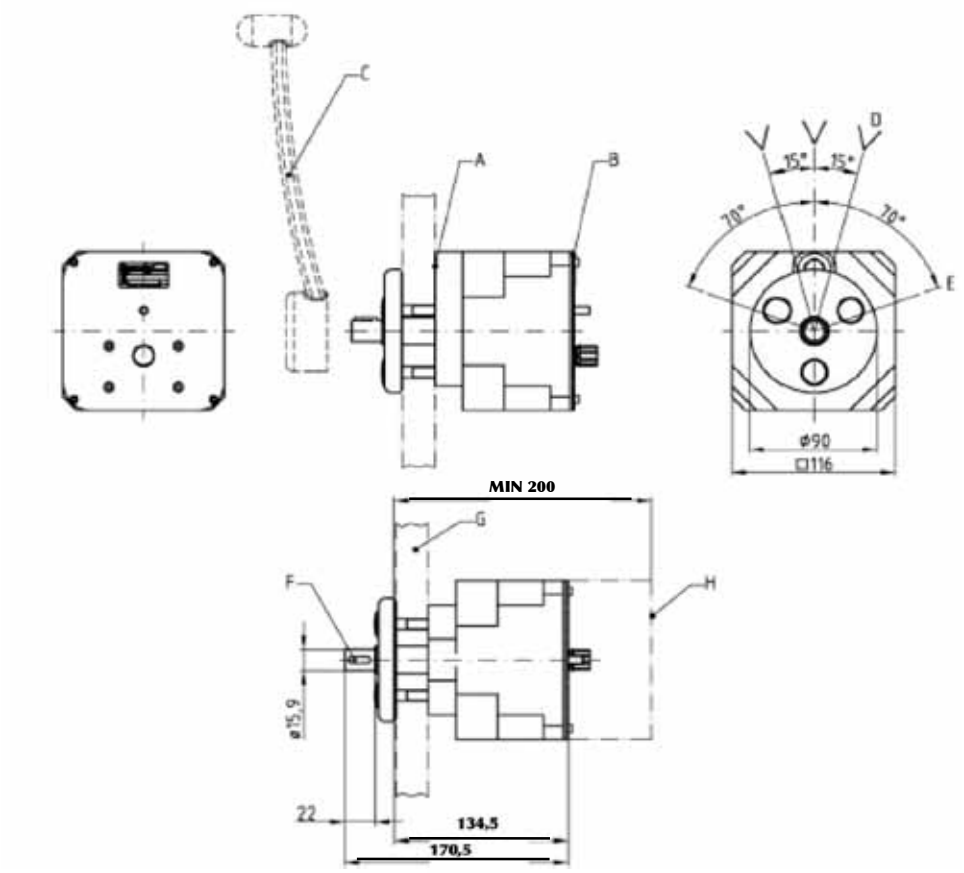


1. control head type 251, 2. operating module type 251, 3. cable M12, 4. handle (has to be ordered separately), 5. installation space for connectors

Control head system – type 251 – Palm Beach

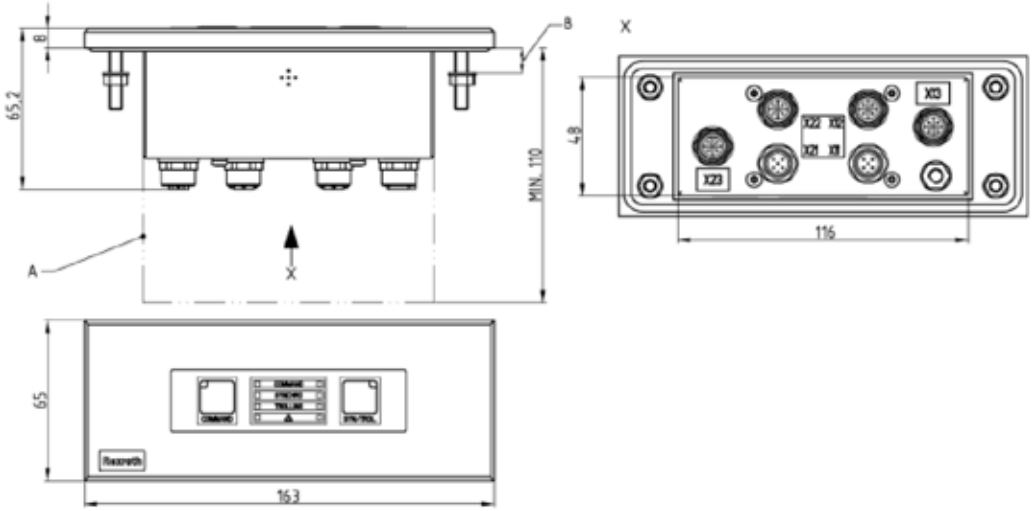
for fixed propeller systems

Figure 2 – technical drawing – control head type 251



A. break force adjustable after removal of cap, B. detent force adjustable after removal of cover, C. lever (figure 4), D. detent positions, E. lever amplitude, F. parallel key form A 3/16" × 3/16" × 5/8" B.S. 46, G. thickness of panel plate 10 mm up to 25 mm; for panel plates thinner than 20mm, distance plates are enclosed, H. installation space for connectors

Figure 3 – technical drawing – operating module type 251



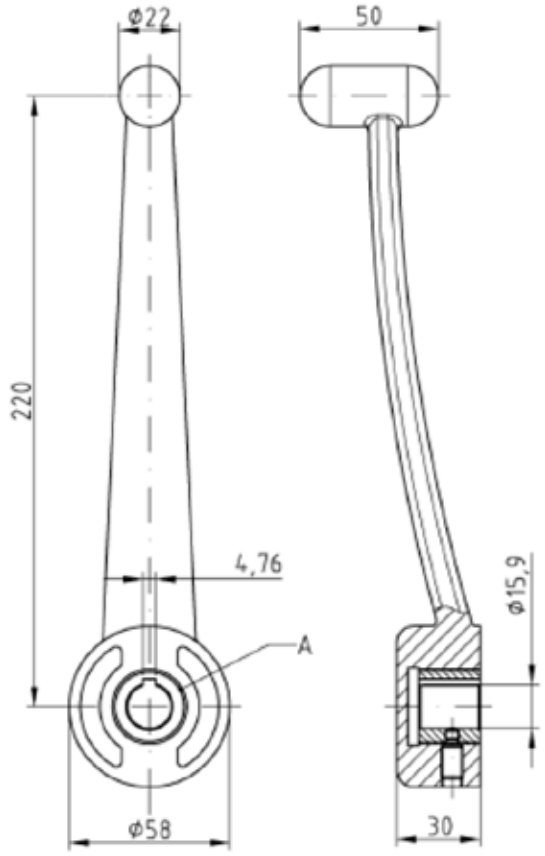
X11, X12, X21, X22 CAN-bus
X13, X23 control head

A) installation space for connectors
B) thickness of panel plate 2mm up to 20 mm

Control head system – type 251 – Palm Beach

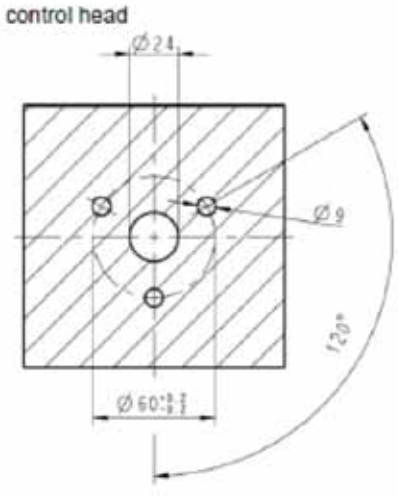
for fixed propeller systems

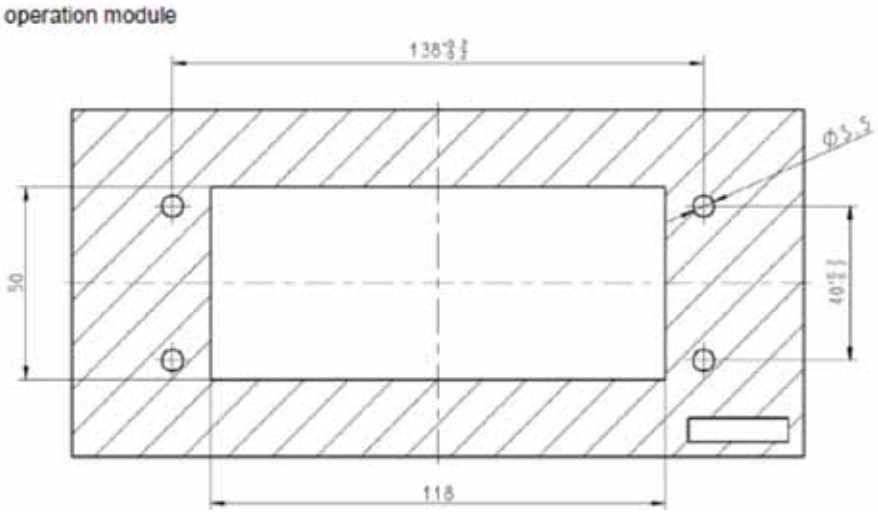
Figure 4 – technical drawing – handle for control head type 251



A handle can be adjusted in steps of 10°.

Panel cutout





Joystick control system – type 530

Technical data

Funktion		Joystick control system for Marex OS II/III
Supply voltage		24 V DC -25% / +30% 12 V DC -25% / +30%
Nominal current consumption		24 V : 3 A 12 V : 6 A
Fuse		10 A (T)
Operating temperature		-20°C to +70°C
Vibration solidity		4 g (2 ... 100 Hz); IEC 60068-2-6, test F
Protection type	Joystick	IP67
	Control unit	IP54 acc. to IEC 60529 (DIN VDE 0470)
Housing control unit		stainless steel
Weight		see table below

→ The joystick control system for reversing gear application
is designed to transmit signals to the MPC for reversing gear. The joystick system can be used in combination with a Marex OS II/III remote control system.

Type numbers

Device	Description	Weight [kg]	Type number
Basic system	Consists of: Joystick type 530, Can-IO light type 230 (teach-in of joystick included), operating module type 242, MPC 3D type cabinet, GPS compass (incl. 6m cable), terminating resistor M12, CAN-bus cables M12 to connect joystick and operating module	app. 10.2	336 101 896 0
Additional station	Consists of: Joystick type 530, Can-IO light type 230 (teach-in of joystick included), operating module type 242, CAN-bus cables M12 to connect joystick and operating module	app. 2.2	336 102 071 0

Spare parts

Device	Weight [kg]	Type number
Joystick type 530	0.6	R417 002 407
Operating module type 242*	0.4	R417 000 506
Marine propulsion controller MPC 3D	4.6	346 069 040 0
Can-I/O light	1.2	R419 300 376
GPS compass	0.4	R419 801 301
NMEA cable 6m		R419 801 302

* project specific labelling

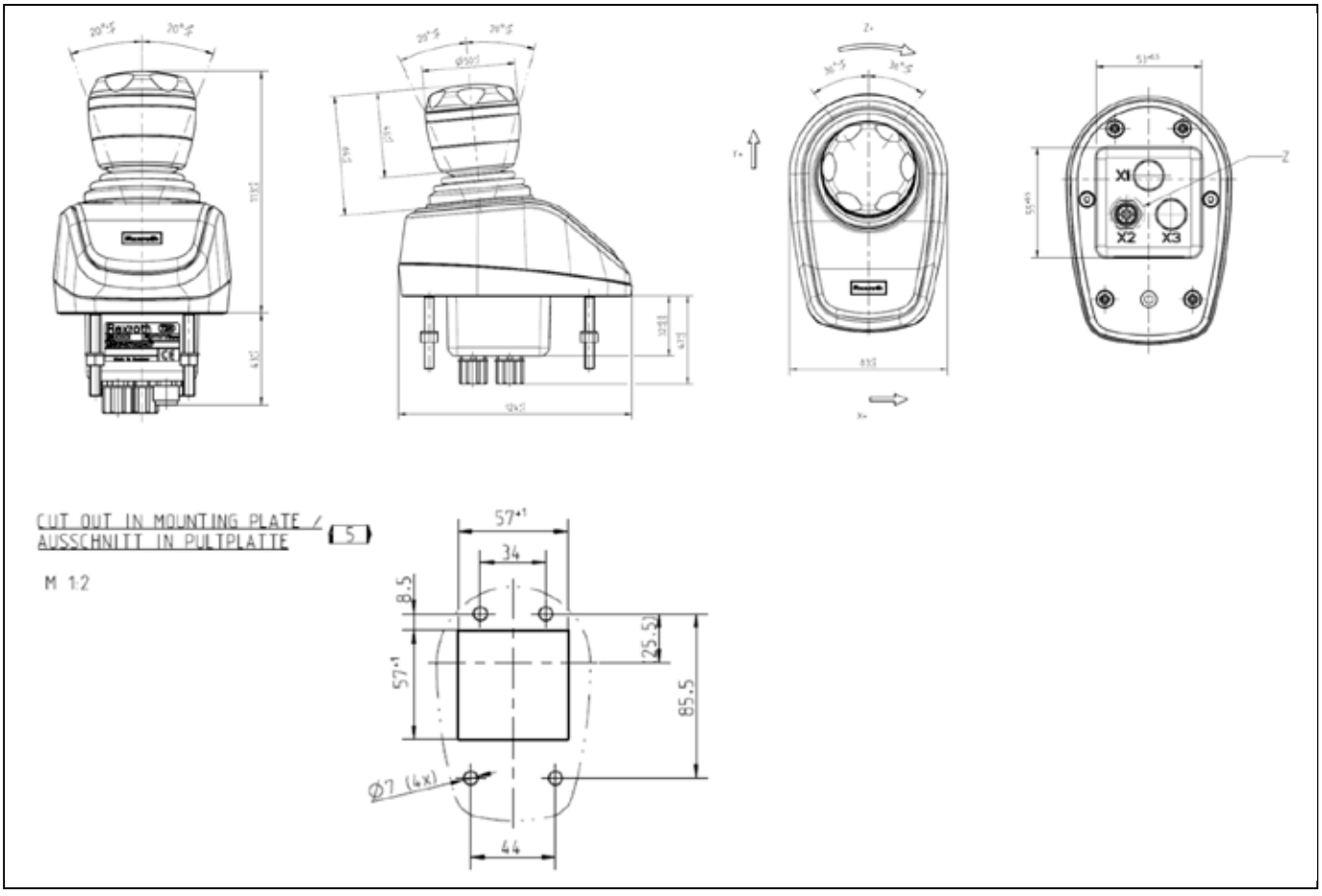
Accessories

Device	Description	Type number
Thruster control unit, version digital	Additional I/O for thruster control	R417 002 538
CAN bus cable M12		see page “cable equipped with M12 plugs”
Terminating resistor M12, male		894 105 426 4
Terminating resistor M12, female	Necessary for NMEA cable extension	894 105 427 4
T-connector	Necessary for NMEA cable extension	R419 800 162
Power supply interruption cable M12, 0,5 m	Necessary to connect 3rd party NMEA participants	R419 801 309

Joystick – type 530

Technical drawing

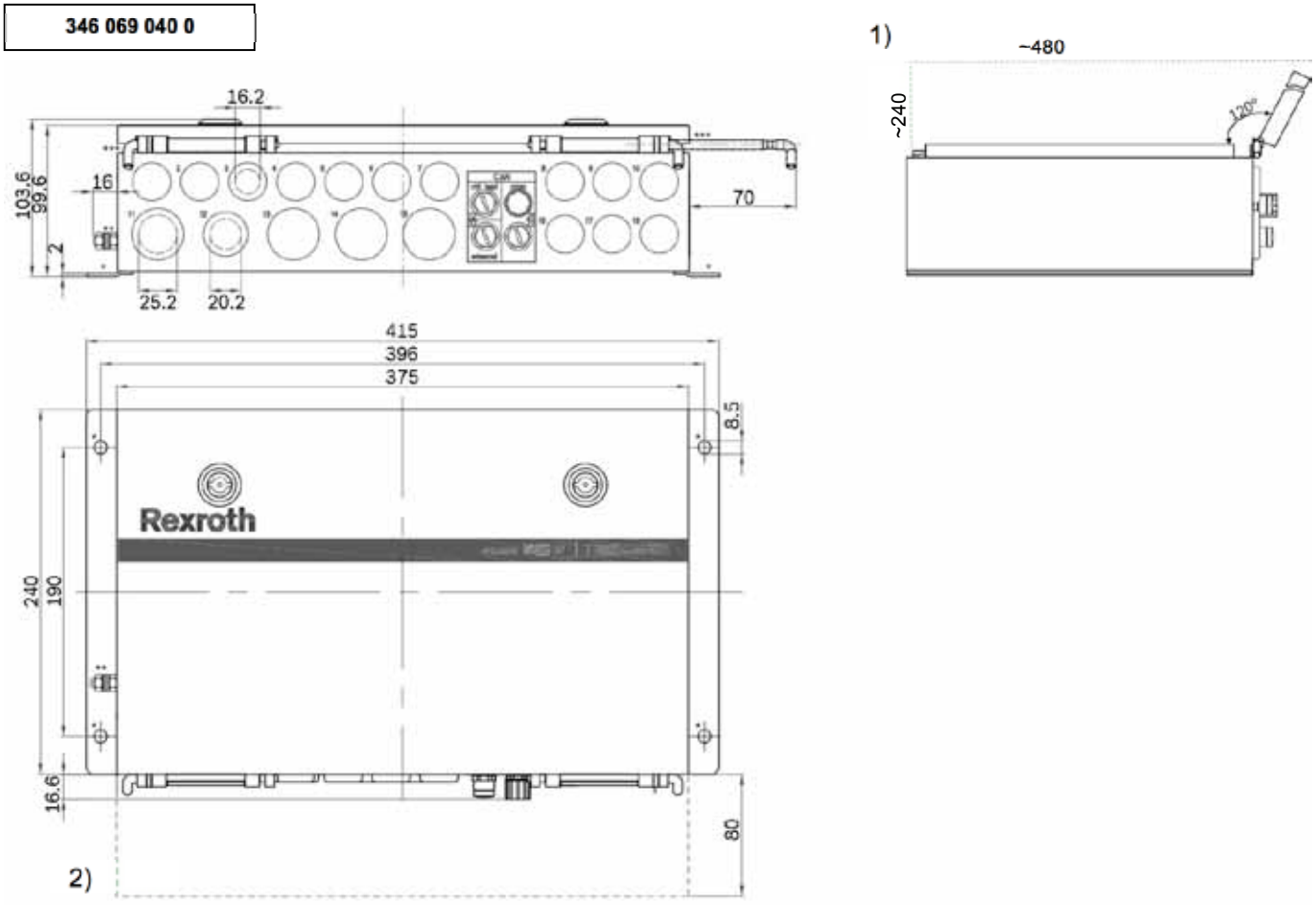
R417 002 407



Marine propulsion controller 3D – type cabinet

Technical drawing

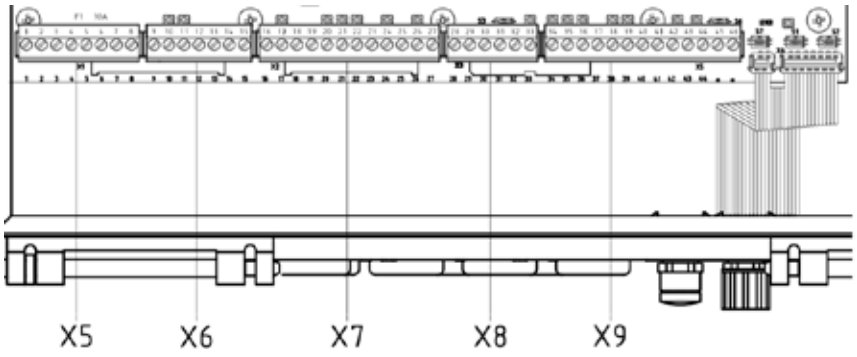
346 069 040 0

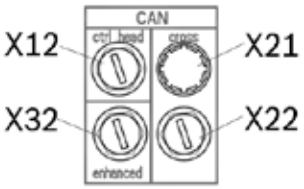


1) please provide additional space for the door (app. 240 mm), 2) please provide additional space for wiring in the area of connections (app 80 mm), mounting position is optional, preferably as drawn

Marine propulsion controller 3D – type cabinet

Terminal assignment





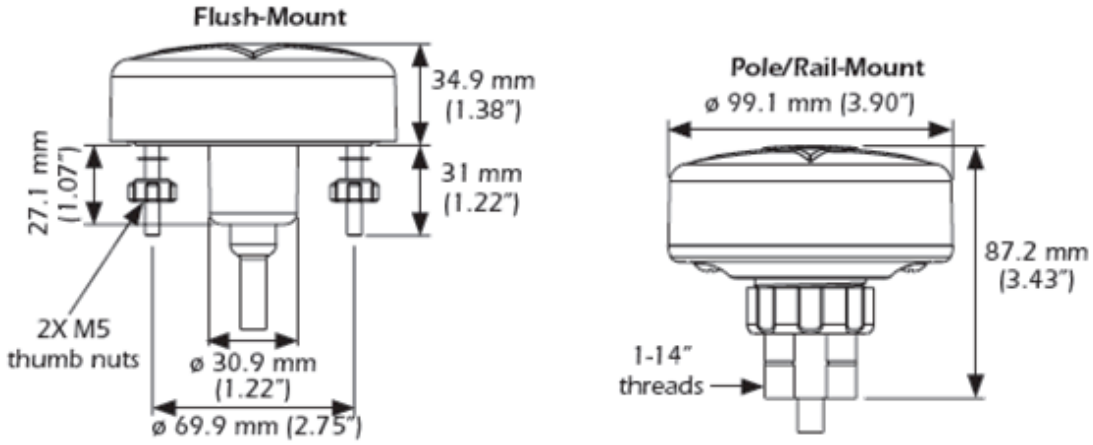
Connection	Pin	Channel no.	Function		Description
X5	1,2,3	Vs+	+	power supply	power supply of MPC 12 V DC -20%/+30% 24 V DC -25%/+30%
	4,5,6	Vs-	-		
	7,8			free usable	support clamp for free use
X6	9	AO 1*	-	n.a.	n.a. (f in Hz)
	12		-		
	10		+	n.a.	
	11		+		
	13	AI 1*	+	n.a.	n.a. (potentiometer)
	14		signal		
	15		-		
X7	16	DO 1	NO	collected alarm (MPC 2, 3D)	relay output for an external alarm system
	17		+		
	18		NC		
	19	DO 2** DO 3**	+	bow thruster PS/SB bow thruster SB/PS	relay output for direction of digital bow thruster
	20		NO		
	21		NO		
	22	DO 4**	+	optionally: stern thruster PS/SB	relay output for direction of digital stern thruster
	23		NO		
	24	DO 5	+	optionally: stern thruster SB/PS	relay output for direction of digital stern thruster
	25		NO		
	26	DO 6	+	release of thrusters	relay output for enabling of thrusters
	27		NO		
X8	28	AO 2	+	analogue output for bow thruster	analogue output 0-20 mA / 4-20 mA / 0-10 V / PWM
	29		-		
	30	AO 3	+	analogue output for stern thruster	analogue output 0-20 mA / 4-20 mA
	31		-		
	32	AI 2	+	n.a.	n.a. (f in Hz)
	33		-		
X9	34	DI 1	+	optionally: status signals of bow thruster	digital feedback of thruster (active)
	35	DI 2	+		digital feedback of thruster (alarm)
	36	DI 3	+		n.a.
	37		-		
	38	DI 4	+	optionally: status signals of stern thruster	digital feedback of thruster (active)
	39	DI 5	+		digital feedback of thruster (alarm)
	40		-		
	41	DI 6	+	n.a.	n.a.
	42		-		
	44	AI 3	+	n.a.	n.a. (f in Hz)
	45		-		
	43	AO 4*	+	n.a.	n.a.
	46		-		
X12			CAN bus (3D)		CAN bus (to thruster control unit/joystick)
X21, X22			CAN bus (cross)		CAN bus (to Marex OS II/III MPC)
X32			NMEA 2000		NMEA2000 (to compass, thruster)

* these terminals are not galvanically separated from the power supply (only for actuators and sensors)
** relay outputs with bistable behaviour; these outputs don't change the state during power failures

Compass

Technical drawing

R419 801 301



Notices to mountain the compass:

- Compass must have a clear view of the sky to all directions
- To prevent interference to the magnetic compass, the sensor must be mounted 1,5 m:
  - Above a metal hull/deck
  - Away from any structures or equipment that contain ferrous metals
  - Away from anything that may create a magnetic field.
- Mount the Compass:
  - 1m away from any VHF radio
  - 4m away from any antenna (MF/HF)
  - 3m away from loop antenna
  - 3m away from radar and not within a its beam
  - 5m away from INMARSAT and not within its beam

Operating / indication module – type 231 black version

Technical data

Function	For indication and / or data input
Operation current	0.8 A
Operating temperature	-20°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	I²C bus suitable operation / indication module
Indication	by LED
Weight	0.8 kg

→ The operating / indication module – type 231 black version
is designed for indication and / or data input. The operating / indication module can be connected to the control head 230.

Type numbers

Fig.	Operating module	Color key*	Key 1	Key 2	Key 3	Key 4	Type number
1	standard, horizontal	R / Y / Y / G	alarm / test	take-over	special function	dimmer	362 231 202 0
2	standard, vertical	Y / G / Y / R	take-over	dimmer	special function	alarm / test	362 231 203 0
3	special conf.	Y / Y / G / Y	take-over	ind. Astern	ind. Neutral / dimmer	ind. Ahead	362 231 291 0
4	gear function	Y / Y / Y / Y	ind. warming up	ind. Astern	ind. Neutral	ind. Ahead	362 231 211 0
5	engine free conf.	G / R / Y / Y	free [start]	free [stop]	free	free	362 231 303 0
6	free configuration	Y / Y / Y / Y	free	free	free	free	362 231 302 0

* R = red, G = green, Y = yellow, ind. = indication

Accessories

Device	Description	Type number
Covering plate for panel cutouts	Plate without foil to cover cutouts	362 231 209 0

Figures of foil

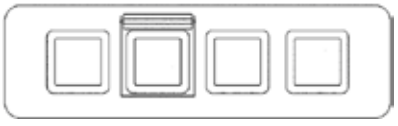
1

2

3

4

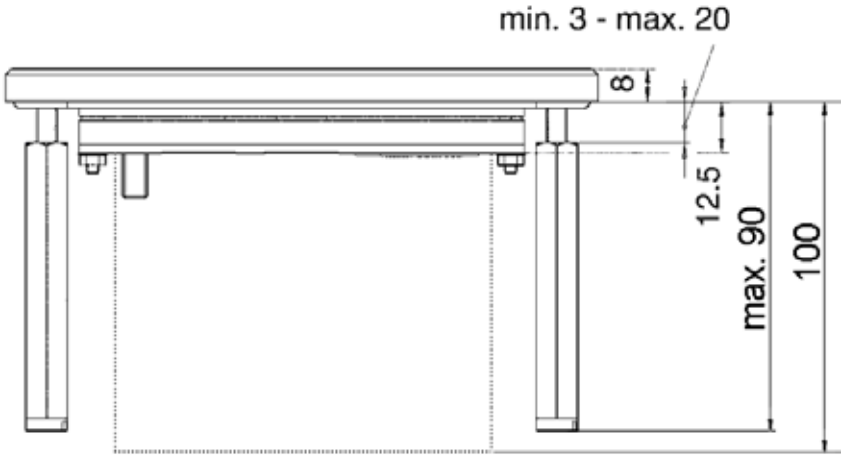
5

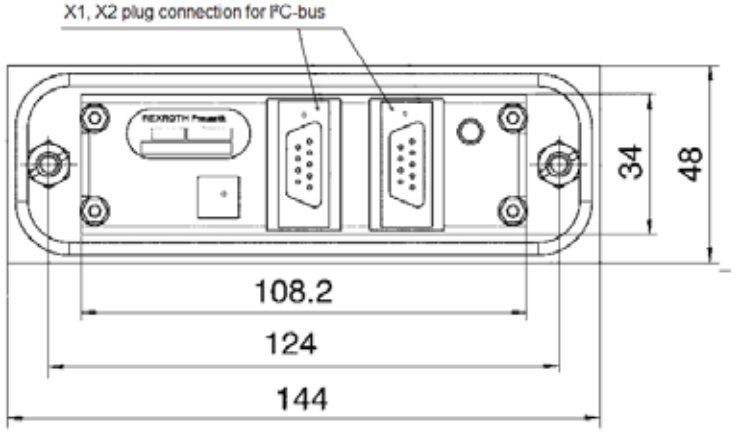


6

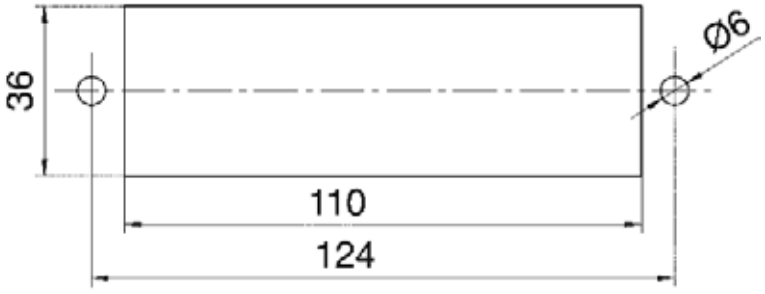
Operating / indication module – type 231 black version

Technical drawing





Panel cutout



Operating / indication module – type 242

Technical data

Function	For indication and / or data input
Operation current	0.8 A
Operating temperature	-20°C to +70°C
Protection category	IP66 acc. to IEC 60529
Design	CAN bus suitable module
Indication	by LED
Weight	0.8 kg

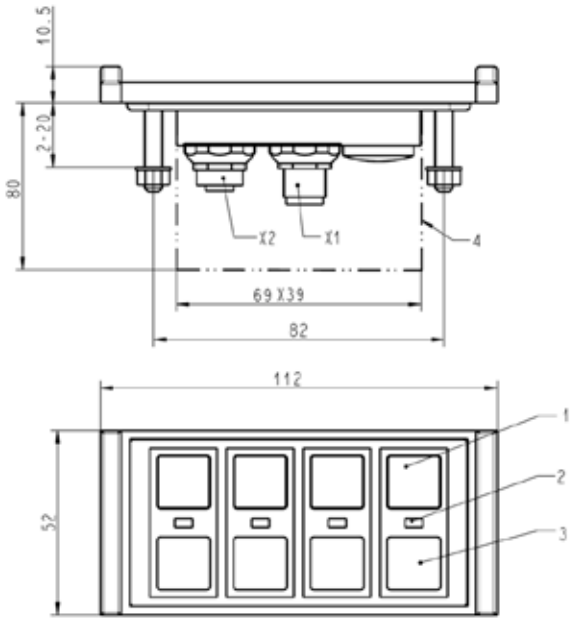
→ The operating / indication module type 242
is designed for indication and / or data input. The operating / indication module can be connected to the CAN-bus of remote control.

Type numbers

Color key*	Key 1	Key 2	Key 3	Key 4	Type number
G / R / Y / Y	free (dimmer)	free (alarm/test)	free (take-over)	free (special function)	R417 000 506
Y / Y / Y / Y	free	free	free	free	R417 000 243

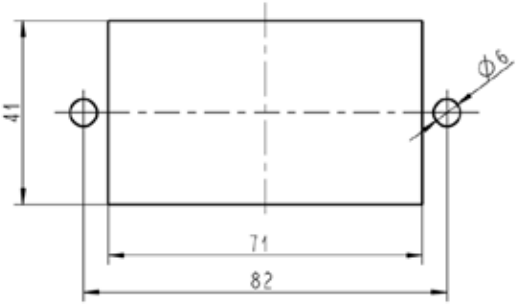
* R = red, G = green, Y = yellow, ind. = indication

Technical drawing



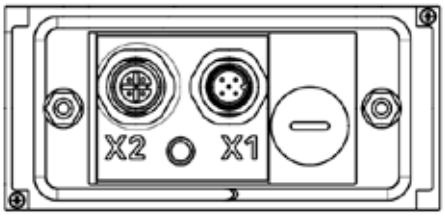
1) title block (the fields can only be labelled once), 2) LEDs, 3) push buttons, 4) installation space for connectors

Panel cutout



Operating / indication module – type 242

Pin assignment



Connection	Description
X1	CAN input
X2	CAN output

Display and operating unit – type 230

Technical data

Function	Visualization of remote control data and extended input method
Supply voltage	38 V DC -25% / +30% 24 V DC -25% / +30% 12 V DC -20% / +30%
Nominal current consumption	38 V : 0.13 A 24 V : 0.2 A 12 V : 0.4 A
Fuse	1.5 A (T)
Operating temperature	-20°C to +70°C
Storage temperature	-25°C to +85°C
Relative humidity	95%
Vibration solidity	4g, (2 … 100Hz), IEC 60068-2-6, test Fc
Isolation strength	500 V AC
Applied EMV standards	EN 60945:2002
Protection category	above desk IP66, below desk IP20 according to IEC 60529
Housing	stainless steel
Weight	1.5 kg

→ The display and operating unit – type 230
is designed to visualize feedbacks and process user inputs. The unit consists of a sunlight-suitable 5.7“ LCD display with 4 operating keys and 1 joystick. Up to 4 "soft keys" can be assigned to each screen page and the operation can be applied to the CAN-bus as a key. The joystick operations can be used to select the page and the rotational movement can be applied to the CAN-bus as an analog value.
The CAN-bus can read analog and binary values. Up to 6 analog instruments can be indicated per page. The device can process up to 10 pages. Two galvanically isolated CAN-buses can be read and processed.

Type numbers

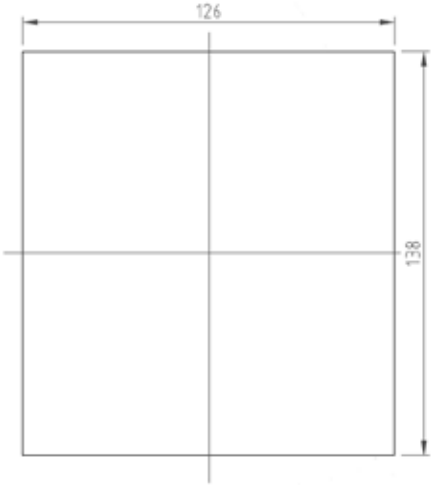
Device	Type number
Display and operating unit – type 230	R419 300 356

Accessories

Device	Description	Type number
Programming adapter, SD card *	Import of new graphics and operating concepts	on request

* software version and version of the main pcb are required

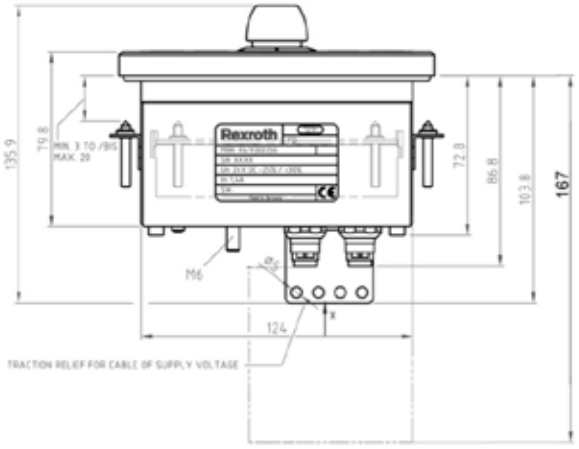
Panel cutout

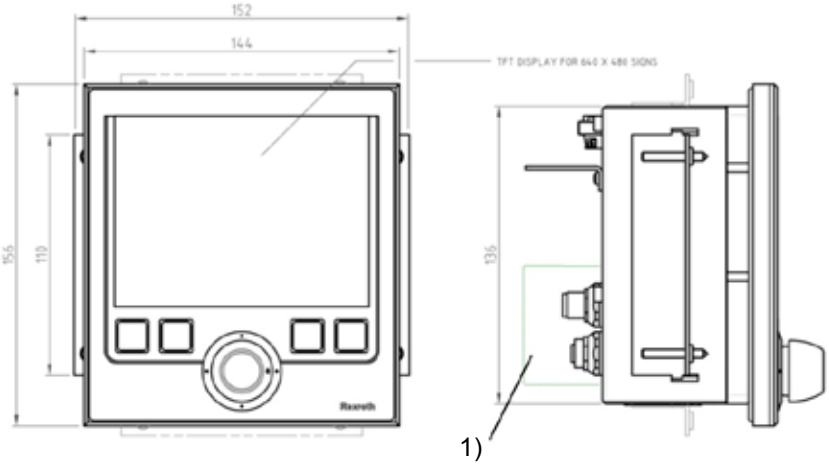


max. panel thickness: 20 mm.

Display and operating unit – type 230

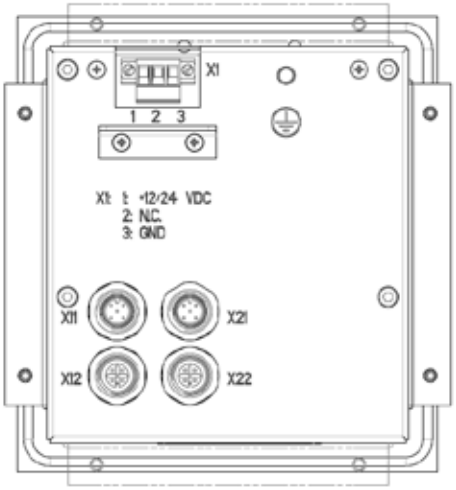
Technical drawing





1) please provide additional space for wiring in the area of the M12-connectors 80 mm

Pin assignment



Connection	Description
X1	power supply 38 V DC -25% / +30% 24 V DC -25% / +30% 12 V DC -20% / +30%
X11	CAN in- / output starboard
X12	CAN out- / input starboard
X21	CAN in- / output portside
X22	CAN out- / input portside

Display and operating unit – type 230

Examples of screen pages

Operation modes

The following pictures show examples of a display page.
To keep it clear, the screen is divided into 3 areas:

- round instruments, bargraphs or digital displays
- function displays with text
- current assignment of the operating keys

- For a further optical structuring the function displays are to be assigned in a double or triple pattern. 1 or 2 main tachometers are provided per page.

Graphic elements

- round instruments: versions for 1 or 2 per page, fix scale ranges (0 … 1500, 0 … 2000, 0 … 2500, 0 … 3000, 0 … 75), unit adaptable, display of the digital value possible, additional text field, pointers for set value and feedback
- auxiliary round instruments (addition for 1-page round instrument): fix scale ranges (0 … 150 %, -100 … 100 %, 0 … 500 l), unit adaptable, indication of the digital value possible, pointers for set value and feedback
- bargraphs: horizontal and vertical versions, classification-conform coloring red/green or blue, scale ranges (0 … 100 %, -100 … 100 %)
- digital displays: versions for 2 or 3 per page, 5 digits excl. algebraic signs, unit adaptable, additional text field
- function displays with integrated LED: versions for 2 or 3 per page, LED functions: permanent light, off, flashing, left-aligned and right-aligned versions as well as 2 LEDs per display for twin-engine systems. LED's color is adaptable
- function displays without LED for presentation of enumerations (e. g. active control station)
- dividing line

- assignment of operating keys: symbols for dimming, day/night, page up/down, page left/right, as well as free text

Note: no more than 5 analog displays should be shown per page to allow a quick optical comprehension of the illustration.

Marine propulsion controller – MPC 2 modular

Technical data

Function	Reversing gear propulsion system
Supply voltage	24 V DC – 25 % / + 30 % or 12 V DC – 20 % / + 30 %
Nominal current consumption	24 V DC : 3 A 12 V DC : 6 A
Fuse	10 A (T)
Operating temperature	-20°C to +70°C
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Protection category	IP20 acc. to IEC 60529
Design	modular
Weight	2.4 kg

→ The marine propulsion controller – MPC 2 modular
is designed as a central processing unit of the remote control. It is also responsible for data input and output.

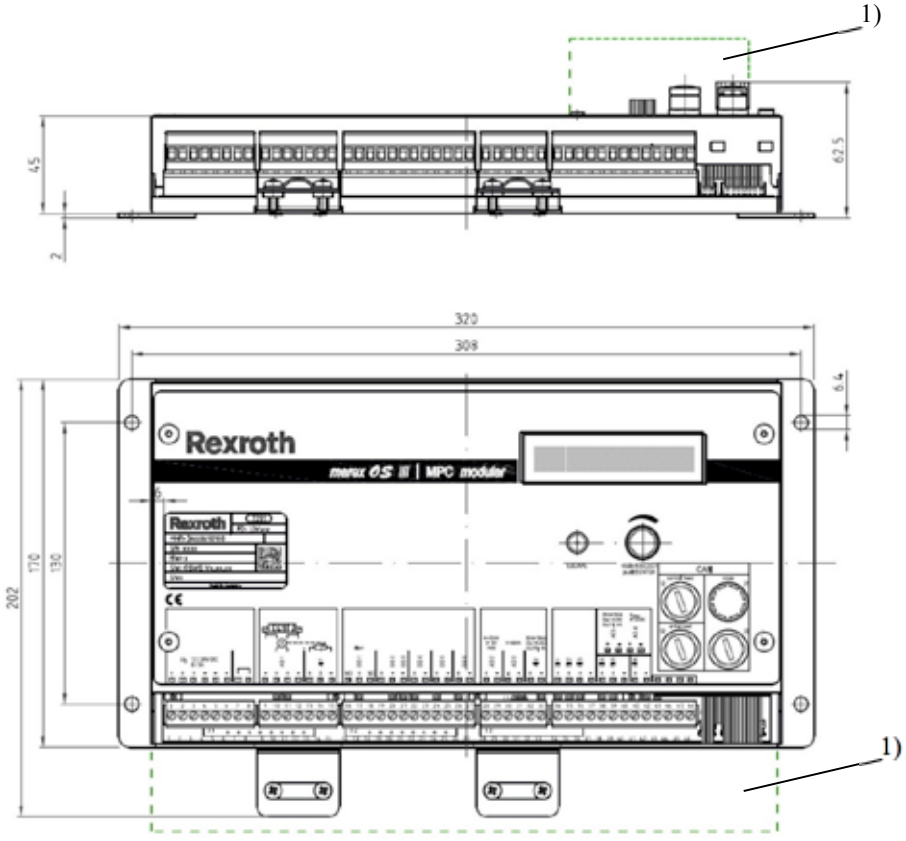
Type numbers

Device	Type number
Marine propulsion controller – MPC 2 modular	346 069 010 0

Accessories

Device	Type number
Fuse	894 245 201 4

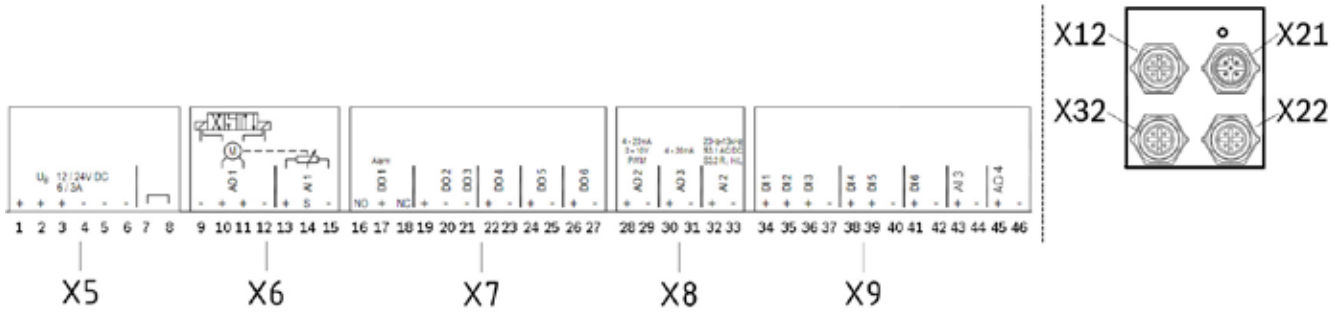
Technical drawing



1) please provide additional space for wiring in the area of the M12-Connectors 80 mm and the cable clamps 30 mm; mounting position is optional, preferably as drawn.

Marine propulsion controller – MPC 2 modular

Terminal assignment



Connection	Pin	Channel no.	Function		Description
X5	1, 2, 3	Vs+	+	power supply	power supply of MPC 12 V DC -20% / +30% 24 V DC -25% / +30%
	4, 5, 6	Vs-	-		
	7, 8		7 8	free usable	support clamp for free use
X6	9	AO 1*	-	terminals for current measurement for proportional valve A(9) and B(12)	proportional valve: 12/24 V (3.0 A), 50…20000 Hz DC actuator: 12/24 V (3.5 A), 50…20000 Hz
	12		-		
	10		+	terminals for proportional valve A(10) and B(11) or for DC actuator(10, 11)	
	11		+		
	13	AI 1*	+		
	14		signal	potentiometer	potentiometer feedback for DC actuators
	15		-		
X7	16	DO 1	NO		
	17		+	alarm	relay output for an external alarm system
	18		NC		
	19				
	20	DO 2**	NO	ahead	relay outputs for an electrical reversing gear
	21	DO 3**	NO	astern	
	22	DO 4**	+		
	23		NO	trolling on/off	relay output for trolling
	24	DO 5	+		
	25		NO	start release	relay output for start release
	26	DO 6	+		
	27		NO	engine speed synchronization	relay output - speed synchronization on/off
X8	28	AO 2	+	electronic speed adjustment	analogue output 4-20 mA / 0-10 V / PWM
	29		-		
	30	AO 3	+	electronic trolling	analogue output 4-20 mA
	31		-		
	32	AI 2	+	frequency input for a rpm feedback	engine speed measurement frequency: 20-13000 Hz
	33		-		
X9	34	DI 1	+	ahead	digital feedback signal of gear box 6-32 V DC
	35	DI 2	+	astern	
	36	DI 3	+	stop	
	37		-	common terminal DI 1- DI 3	
	38	DI 4	+	emergency stop	digital input for special function 6-32 V DC
	39	DI 5	+	security stop	
	40		-	common terminal DI 4, DI 5	
	41	DI 6	+	digital input for release according to ABS classification	digital input for special function 6-32V DC
	42		-		
	44	AI 3	+	frequency input for shaft speed measurement	input for special function 20-13000 Hz
	45		-		
	43	AO 4*	+	power supply for pick-up at AI 3	50 mA / 5-12 V (for AO 4,a) / 2-10 V (for AO 4,b)
	46		-		
X12			CAN bus (control head)		CAN bus (control head)
X21, X22			CAN bus (cross)		CAN bus (extension modules)
X32			terminating resistor		CAN bus (external modules)

* these terminals are not galvanically separated from the power supply (only for actuators and sensors)
** relay outputs with bistable behaviour; these outputs don't change the state during power failures

Marine propulsion controller – MPC 2 cabinet

Technical data

Function	Reversing gear propulsion system
Supply voltage	24 V DC – 25 % / + 30 % or 12 V DC – 20 % / + 30 %
Nominal current consumption	24 V DC : 3 A 12 V DC : 6 A
Fuse	10 A (T)
Operating temperature	-20°C to +70°C
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Protection category	IP54 acc. to IEC 60529
Design	cabinet
Weight	4.6 kg

→ The marine propulsion controller – MPC 2 cabinet
is the central processing unit of the remote control. It is also responsible for data input and output.

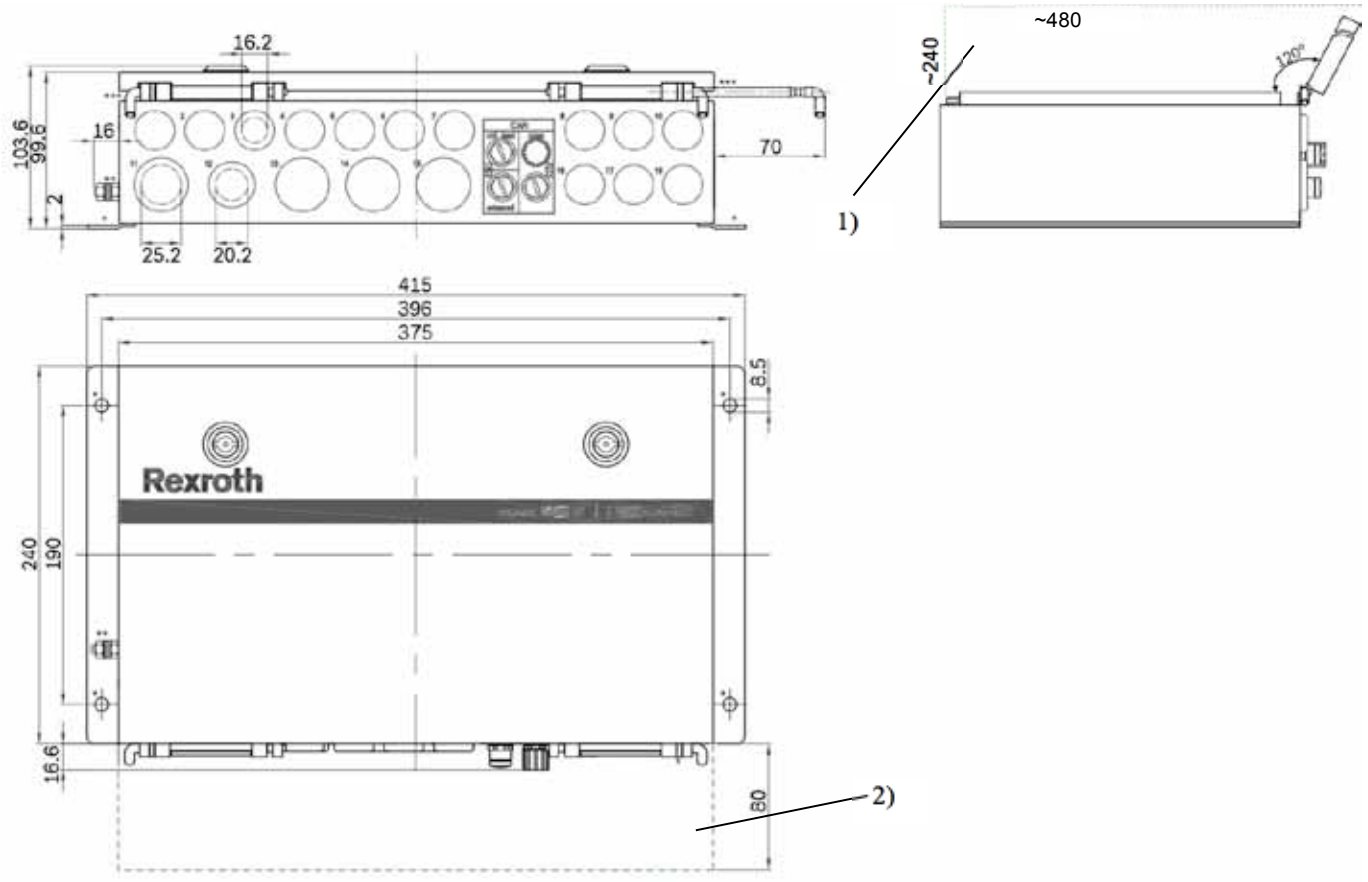
Type numbers

Device	Type number
Marine propulsion controller – MPC 2 cabinet	346 069 012 0

Accessories

Device	Type number
Fuse	894 245 201 4

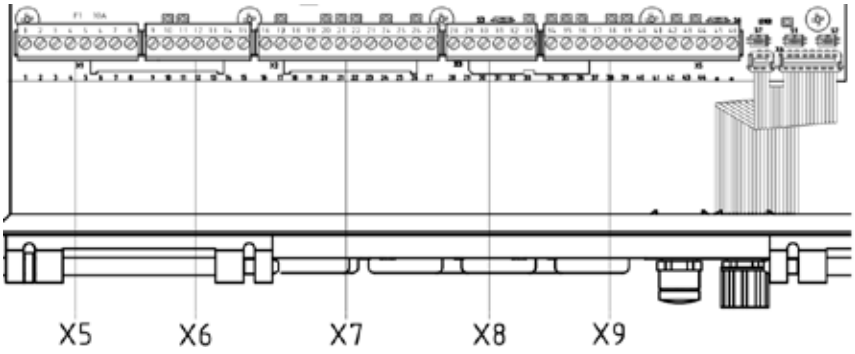
Technical drawing

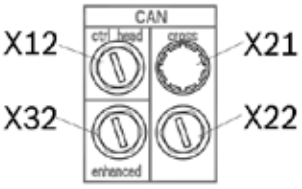


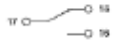
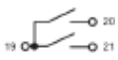
1) please provide additional space for the door (app. 240 mm), 2) please provide additional space for wiring in the area of connections (app 80 mm); mounting position is optional, preferably as drawn

Marine propulsion controller – MPC 2 cabinet

Terminal assignment





Connection	Pin	Channel no.	Function		Description
X5	1,2,3 4,5,6	Vs+ Vs-	+ -	power supply	power supply of MPC 12 V DC -20%/+30% 24 V DC -25%/+30%
	7,8			free usable	support clamp for free use
X6	9 12	AO 1*	- -	terminals for current measurement for proportional valve A(9) and B(12)	proportional valve: 12/24 V (3.0 A), 50…20000 Hz DC actuator: 12/24 V (3.5 A), 50…20000 Hz
	10 11		+ +	terminals for proportional valve A(10) and B(11) or for DC actuator(10, 11)	
	13 14 15	AI 1*	+ signal -	potentiometer	potentiometer feedback for DC actuators
X7	16 17 18	DO 1	NO + NC 	alarm	relay output for an external alarm system
	19 20 21	DO 2** DO 3**	+ NO NO 	ahead astern	relay outputs for an electrical reversing gear
	22 23	DO 4**	+ NO 	trolling on/off	relay output – trolling
	24 25	DO 5	+ NO 	start release	engine start release (closed if gear setting neutral)
	26 27	DO 6	+ NO 	engine speed synchronization	relay output - speed synchronization on/off
X8	28 29	AO 2	+ -	electronic speed adjustment	analogue output 4-20 mA / 0-10 V / PWM
	30 31	AO 3	+ -	electronic trolling	analogue output 4-20 mA
	32 33	AI 2	+ -	frequency input for a rpm feedback	engine speed measurement frequency: 20-13000 Hz
X9	34 35 36 37	DI 1 DI 2 DI 3	+ + + -	ahead astern stop common DI 1-DI 3	digital feedback signal of gear box 6-32 V DC
	38 39 40	DI 4 DI 5	+ + -	emergency stop security stop common DI 4, DI 5	digital input for special function 6-32 V DC
	41 42	DI 6	+ -	digital input for release according to ABS classification	digital input for special function 6-32 V DC
	44 45	AI 3	+ -	frequency input for shaft speed measurement	input for special function 20-13000 Hz
	43 46	AO 4*	+ -	power supply for pick-up at AI 3	50 mA / 5-12 V (for AO 4,a) / 2-10 V (for AO 4,b)
X12			CAN bus (control head)		CAN bus (control head)
X21, X22			CAN bus (cross)		CAN bus (extension modules)
X32			terminating resistor		CAN bus (external modules)

* these terminals are not galvanically separated from the power supply (only for actuators and sensors)
** relay outputs with bistable behaviour; these outputs don't change the state during power failures

Marine propulsion controller – MPC modular WILL BE REPLACED BY NEW DESIGN

Technical data

Function	Reversing gear propulsion system
Supply voltage	24 V DC – 25 % / + 30 % or 12 V DC – 20 % / + 30 %
Nominal current consumption	24 V DC : 3 A 12 V DC : 6 A
Fuse	10 A (T)
Operating temperature	-20°C to +70°C
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Protection category	IP20 acc. to IEC 60529
Design	modular
Weight	2.4 kg

→ The marine propulsion controller – MPC modular
is designed as a central processing unit of the remote control. It is also responsible for data input and output.

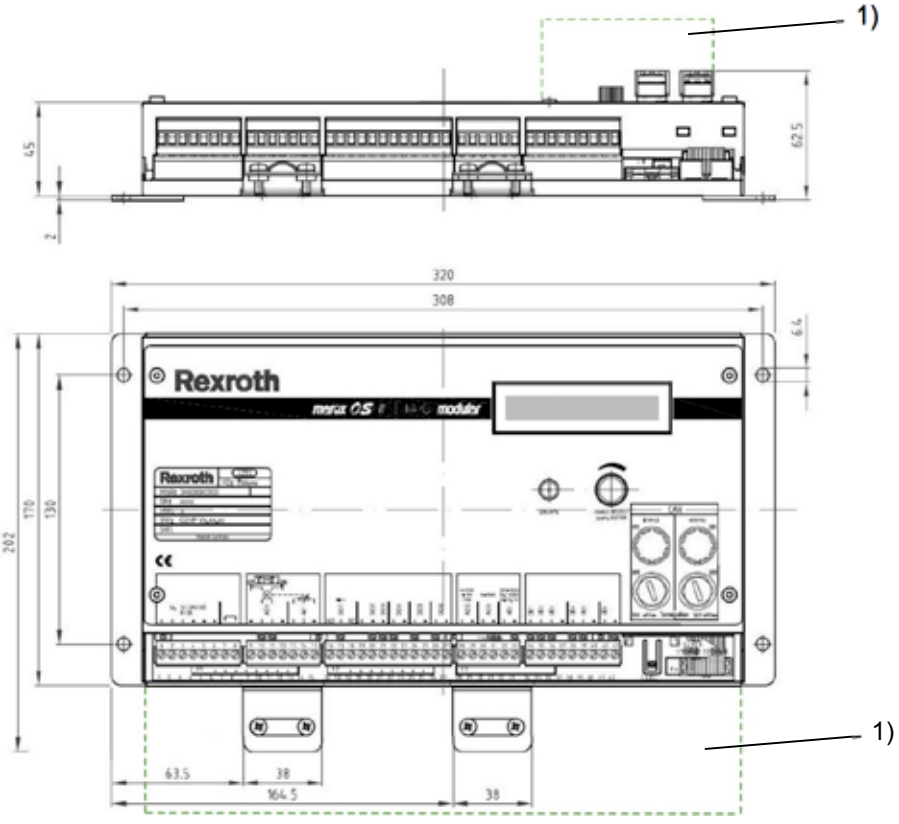
Type numbers

Device	Type number
Marine propulsion controller – MPC modular	346 069 000 0

Accessories

Device	Type number
Fuse	894 245 201 4

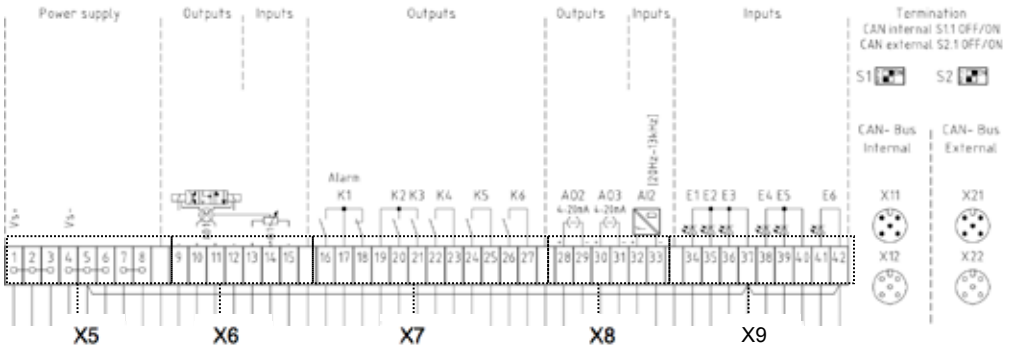
Technical drawing



1) please provide additional space for wiring in the area of the M12-connectors 80 mm and the cable clamps 30 mm; mounting position is optional, preferably as drawn

Marine propulsion controller – MPC modular WILL BE REPLACED BY NEW DESIGN

Terminal assignment



Connection	Pin	Channel no.	Function			Description
X5	1, 2, 3	Vs+	+	power supply		power supply of MPC 12 V DC -20% / +30% 24 V DC -25% / +30%
	4, 5, 6	Vs-	-			
	7, 8		7 8	free usable		support clamp for free use
X6	9	AO 1	-	proportional valve A		current measurement of proportional valve A
	10		+		actuator	proportional valve A and B or DC actuator
	11		+	proportional valve B		proportional valve: 12/24 V (3 A), 50…20000 Hz
	12		-			current measurement of proportional valve B
	13	AI 1	+	potentiometer		potentiometer feedback for DC actuators
	14		signal			
	15		-			
X7	16	DO 1	NO	alarm		relay output for an external alarm system
	17		+			
	18		NC			
	19		+	ahead astern		relay outputs for an electrical reversing gear
	20	DO 2	NO			
	21	DO 3	NO			
	22	DO 4	+	trolling on/off		relay output for trolling
	23		NO			
	24	DO 5	+	start release		engine start release (closed if gear setting neutral)
	25		NO			
	26	DO 6	+	engine speed synchronization		relay output - speed synchronization on/off
	27		NO			
X8	28	AO 2	+	electronic speed setting common AO 2		4-20 mA / 0-10 V / PWM
	29		-			
	30	AO 3	+	electronic trolling common AO 3		4-20 mA
	31		-			
	32	AI 2	+	frequency input for a rpm feedback		engine speed measurement frequency: 20-13000 Hz
	33		-			
X9	34	DI 1	+	ahead astern stop common terminal DI 1- DI 3		digital feedback signal of gear box 6-32 V DC
	35	DI 2	+			
	36	DI 3	+			
	37		-			
	38	DI 4	+	emergency stop special function common terminal DI 4, DI 5		digital input for special function 6-32 V DC
	39	DI 5	+			
	40		-			
	41	DI 6	+	special function common DI 6		digital input for special function 6-32 V DC
	42		-			
X11, X12				internal CAN bus		CAN bus (control head, extension modules)
X21, X22				external CAN bus		CAN bus (communication between MPCs)
S1				terminating resistor		terminating resistor for CAN bus X1 on/off
S2				terminating resistor		terminating resistor for CAN bus X2 on/off

Marine propulsion controller – MPC cabinet WILL BE REPLACED BY NEW DESIGN

Technical data

Function	Reversing gear propulsion system
Supply voltage	24 V DC – 25 % / + 30 % or 12 V DC – 20 % / + 30 %
Nominal current consumption	24 V DC : 3 A 12 V DC : 6 A
Fuse	10 A (T)
Operating temperature	-20°C to +70°C
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Protection category	IP54 acc. to IEC 60529
Design	cabinet
Weight	4.6 kg

→ The marine propulsion controller – MPC cabinet
is the central processing unit of the remote control. It is also responsible for data input and output.

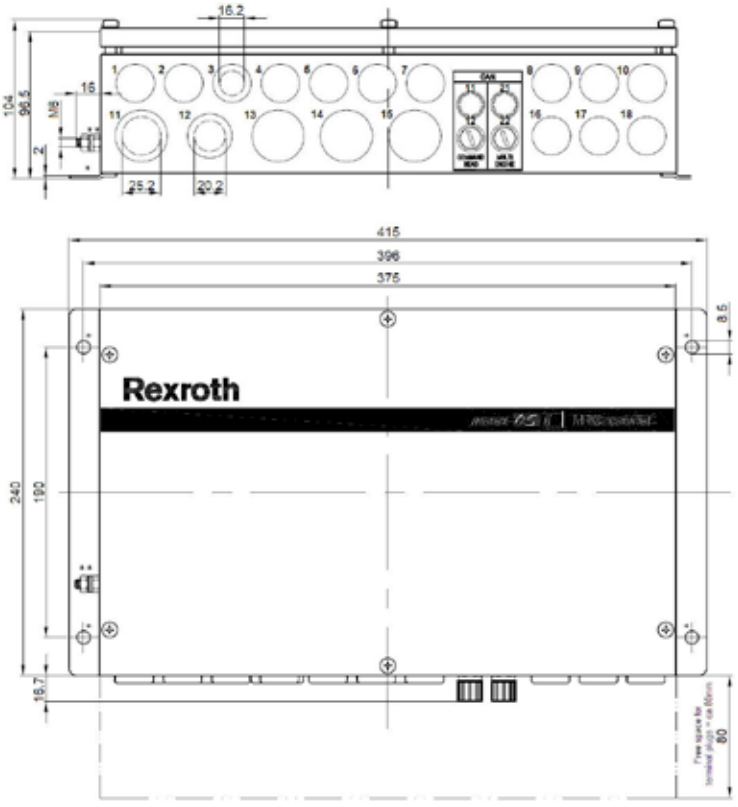
Type numbers

Device	Type number
Marine propulsion controller – MPC cabinet	346 069 002 0

Accessories

Device	Type number
Fuse	894 245 201 4

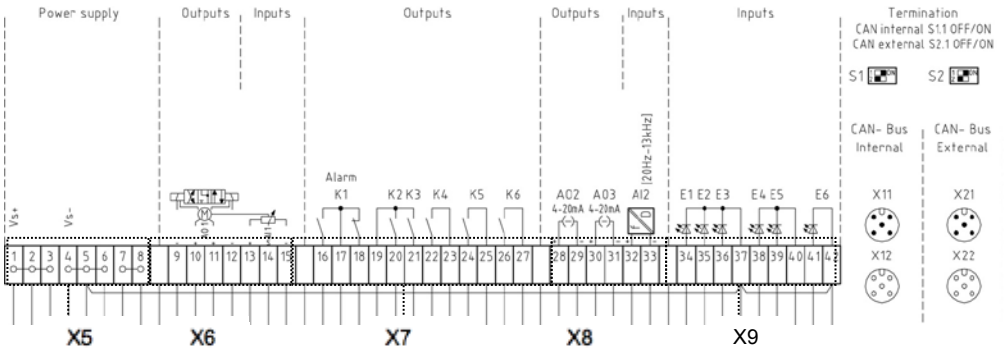
Technical drawing



mounting position is optional, preferably as drawn; keep accessibility for parameterizing of device

Marine propulsion controller – MPC cabinet WILL BE REPLACED BY NEW DESIGN

Terminal assignment



Connection	Pin	Channel no.	Function		Description
X5	1,2,3	Vs+	+	power supply	power supply of MPC 12 V DC -20%/+30% 24 V DC -25%/+30%
	4,5,6	Vs-	-		
	7,8			free usable	support clamp for free use
X6	9	AO 1	-	proportional valve A	current measurement of proportional valve A
	10		+		proportional valve A and B or DC actuator
	11		+	proportional valve B	proportional valve: 12/24 V (3 A), 50…20000 Hz
	12		-		current measurement of proportional valve B
	13	AI 1	+	potentiometer	potentiometer feedback for DC actuators
	14		signal		
	15		-		
X7	16	DO 1	NO	alarm	relay output for an external alarm system
	17		+		
	18		NC		
	19		+		relay outputs for an electrical reversing gear
	20	DO 2	NO	ahead	
	21	DO 3	NO	astern	
	22	DO 4	+	trolling on/off	relay output – trolling
	23		NO		
	24	DO 5	+	start release	engine start release (closed if gear setting neutral)
	25		NO		
	26	DO 6	+	engine speed synchronization	relay output - speed synchronization on/off
	27		NO		
X8	28	AO 2	+	electronic speed setting	4-20 mA / 0-10 V / PWM
	29		-	common AO 2	
	30	AO 3	+	electronic trolling	4-20 mA
	31		-	common AO 3	
	32	AI 2	+	rpm feedback	engine speed measurement
	33		-	common AI 2	frequency: 20-13000 Hz, Us: 1…50 V
X9	34	DI 1	+	ahead	digital feedback signal of gear box 6-32 V DC
	35	DI 2	+	astern	
	36	DI 3	+	stop	
	37		-	common DI 1-DI 3	
	38	DI 4	+	emergency stop	digital input for special function 6-32 V DC
	39	DI 5	+	special function	
	40		-	common DI 4, DI 5	
	41	DI 6	+	special function	digital input for special function 6-32 V DC
	42		-	common DI 6	
X11, X12				internal CAN bus	CAN bus (control head, supplementary modules)
X21, X22				external CAN bus	CAN bus (communication between MPCs)
S1				terminator resistor	terminating resistor for CAN bus X1 on/off
S2				terminator resistor	terminating resistor for CAN bus X2 on/off

Marine propulsion controller – MPC modular for CPP

Technical data

Function	Pitch propeller propulsion system
Supply voltage	24 V DC – 25 % / + 30 % or 12 V DC – 20 % / + 30 %
Nominal current consumption	24 V DC : 3 A 12 V DC : 6 A
Fuse	10 A (T)
Operating temperature	-20°C to +70°C
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Protection category	IP20 acc. to IEC 60529
Design	modular
Weight	2.4 kg

→ The marine propulsion controller – MPC modular for CPP
is designed as a central processing unit of the remote control. It is also responsible for data input and output.

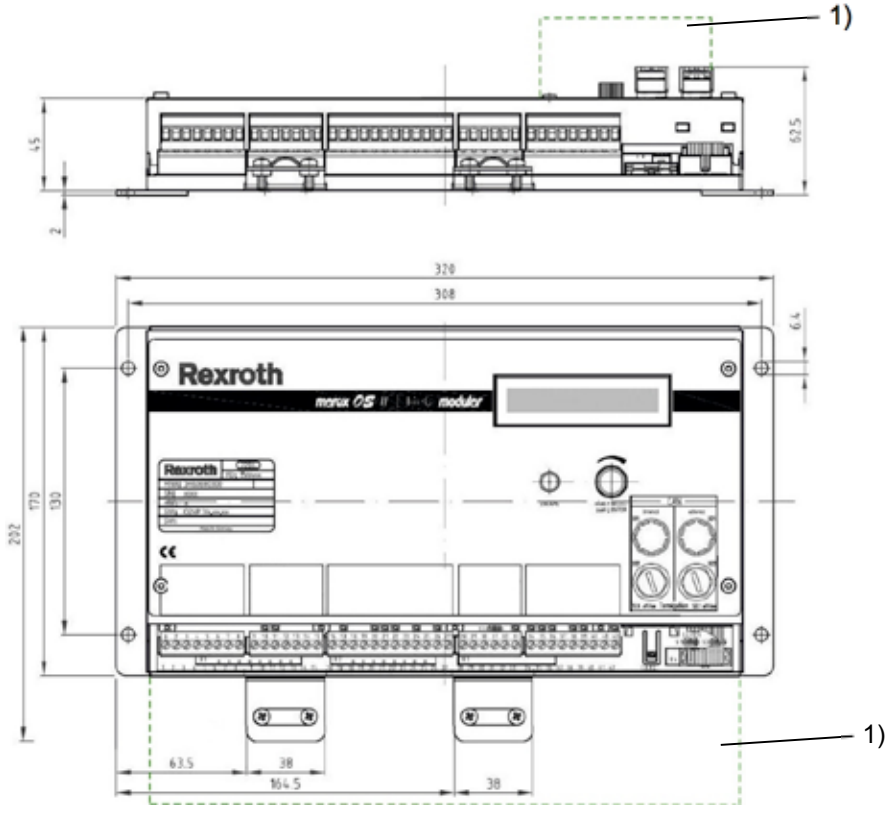
Type numbers

Device	Type number
Marine propulsion controller – MPC modular for CPP	346 069 030 0

Accessories

Device	Type number
Fuse	894 245 201 4

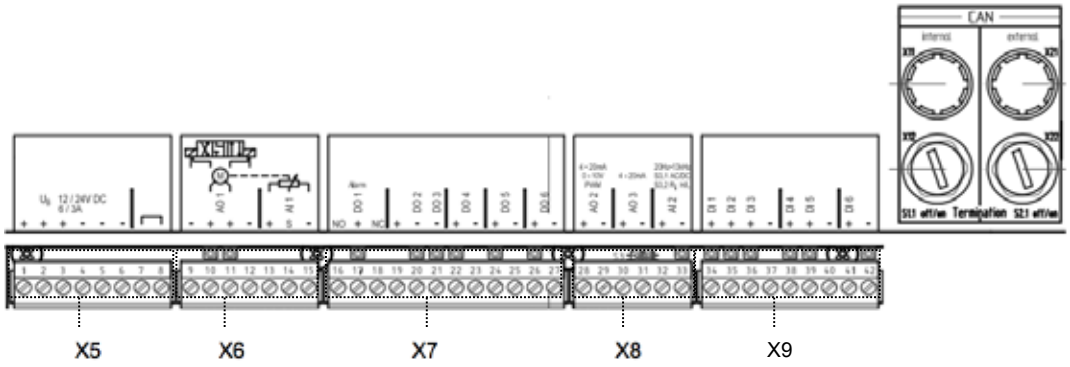
Technical drawing



1) please provide additional space for wiring in the area of the M12-Connectors 80 mm and the cable clamps 30 mm
mounting position is optional, preferably as drawn.

Marine propulsion controller – MPC modular for CPP

Terminal assignment



Connection	Pin	Channel no.	Function	Description
X5	1, 2, 3	Vs+	+	power supply of MPC 12 V DC -20% / +30% 24 V DC -25% / +30%
	4, 5, 6	Vs-	-	
	7, 8		7 8	support clamp for free use
X6	9 12	AO 1	- -	proportional valve: 12/24 V (3.0 A), 50…20000 Hz DC actuator: 12/24 V (3.5 A), 50…20000 Hz
	10 11		+ +	
	13 14 15	AI 1	+ signal -	potentiometer feedback for DC actuators
X7	16 17 18	DO 1	NO + NC	relay output for an external alarm system
	19 20 21	DO 2* DO 3*	+ NO NO	relay outputs for an electrical reversing gear
	22 23	DO 4*	+ NO	relay output for trolling
	24 25	DO 5	+ NO	engine start release (closed if gear setting neutral)
	26 27	DO 6	+ NO	relay output - speed synchronization on/off
X8	28 29	AO 2	+ -	4-20 mA / 0-10 V / PWM
	30 31	AO 3	+ -	4-20 mA
	32 33	AI 2	+ -	engine speed measurement frequency: 20-13000 Hz
X9	34 35 36 37	DI 1 DI 2 DI 3	+ + + -	digital feedback signal of gear box 6-32 V DC
	38 39 40	DI 4 DI 5	+ + -	digital input for special function 6-32 V DC
	41 42	DI 6	+ -	digital input for special function 6-32 V DC
X11, X12				CAN bus (control head, extension modules)
X21, X22				CAN bus (communication between MPCs)
S1				terminating resistor for CAN bus X1 on/off
S2				terminating resistor for CAN bus X2 on/off

* relay outputs with bistable behaviour

Marine propulsion controller – MPC cabinet for CPP

Technical data

Function	Pitch propeller propulsion system
Supply voltage	24 V DC – 25 % / + 30 % or 12 V DC – 20 % / + 30 %
Nominal current consumption	24 V DC : 3 A 12 V DC : 6 A
Fuse	10 A (T)
Operating temperature	-20°C to +70°C
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Protection category	IP54 acc. to IEC 60529
Design	cabinet
Weight	4.6 kg

→ The marine propulsion controller – MPC cabinet for CPP
is the central processing unit of the remote control. It is also responsible for data input and output.

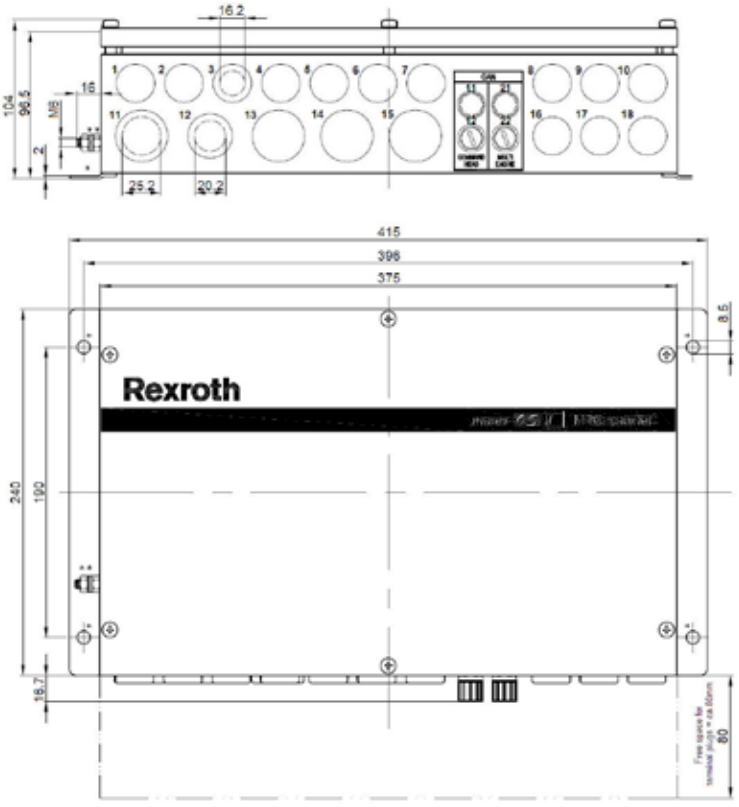
Type numbers

Device	Type number
Marine propulsion controller – MPC cabinet for CPP	346 069 032 0

Accessories

Device	Type number
Fuse	894 245 201 4

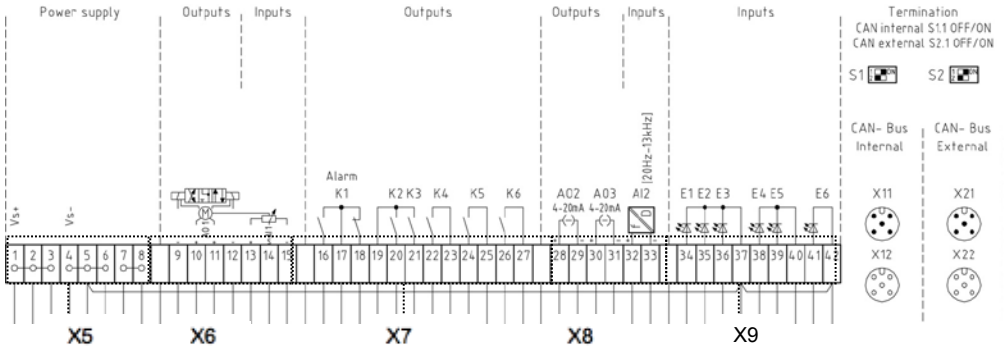
Technical drawing



mounting position is optional, preferably as drawn;
keep accessibility for parameterizing of device

Marine propulsion controller – MPC cabinet for CPP

Terminal assignment



Connection	Pin	Channel no.	Function	Description
X5	1,2,3	Vs+	+	power supply of MPC 12 V DC -20%/+30% 24 V DC -25%/+30%
	4,5,6	Vs-	-	
	7,8			support clamp for free use
X6	9	AO 1	-	current measurement of proportional valve A
	10		+	proportional valve A and B or DC actuator
	11		+	proportional valve: 12/24 V (3 A), 50…20000 Hz
	12		-	current measurement of proportional valve B
	13	AI 1	+	potentiometer feedback for DC actuators
	14		signal	
	15		-	
X7	16	DO 1	NO	relay output for an external alarm system
	17		+	
	18		NC	
	19		+	relay outputs for an electrical reversing gear
	20	DO 2	NO	
	21	DO 3	NO	
	22	DO 4	+	relay output – trolling
	23		NO	
	24	DO 5	+	engine start release (closed if gear setting neutral)
	25		NO	
	26	DO 6	+	relay output - speed synchronization on/off
	27		NO	
X8	28	AO 2	+	4-20 mA / 0-10 V / PWM
	29		-	
	30	AO 3	+	4-20 mA
	31		-	
	32	AI 2	+	engine speed measurement frequency: 20-13000 Hz, Us: 1…50 V
	33		-	
X9	34	DI 1	+	digital feedback signal of gear box 6-32 V DC
	35	DI 2	+	
	36	DI 3	+	
	37		-	
	38	DI 4	+	digital input for special function 6-32 V DC
	39	DI 5	+	
	40		-	
	41	DI 6	+	digital input for special function 6-32 V DC
	42		-	
X11, X12			internal CAN bus	CAN bus (control head, supplementary modules)
X21, X22			external CAN bus	CAN bus (communication between MPCs)
S1			terminator resistor	terminating resistor for CAN bus X1 on/off
S2			terminator resistor	terminating resistor for CAN bus X2 on/off

Preassembled cabinet for Marex OS III

Technical data

Protection category with screw cable gland	IP54 acc. to IEC 60529
Dimension B x H x T	400 mm x 500 mm x 210 mm
Weight	app. 13 kg (empty)

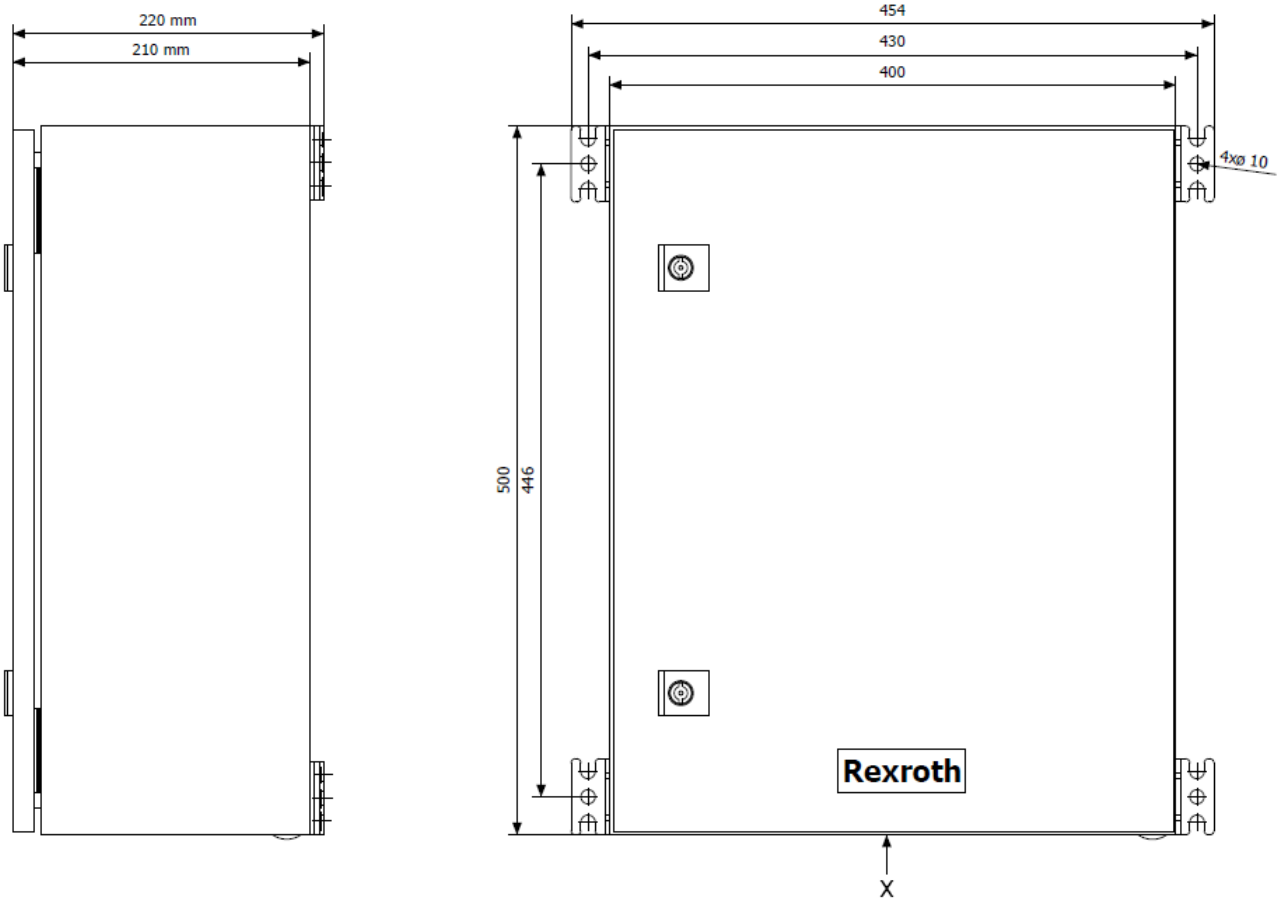
→ The preconfected cabinet for Marex OS III MPC
is the cubicle of electronic equipment for the Marex OS III system.

Device	Type number
The preconfected cabinet for Marex OS III MPC	R417 001 920

Accessories

Device	Type number
MPC modular	see separate page
I/O Module Type 750	see separate page
EPU	see separate page

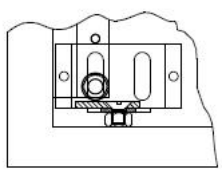
Technical drawing



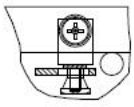
Mounting position is optional, preferably as drawn. Keep accessibility for parameterizing of device.

Preassembled cabinet for Marex OS III

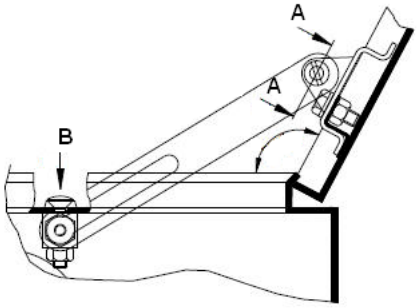
Technical drawing



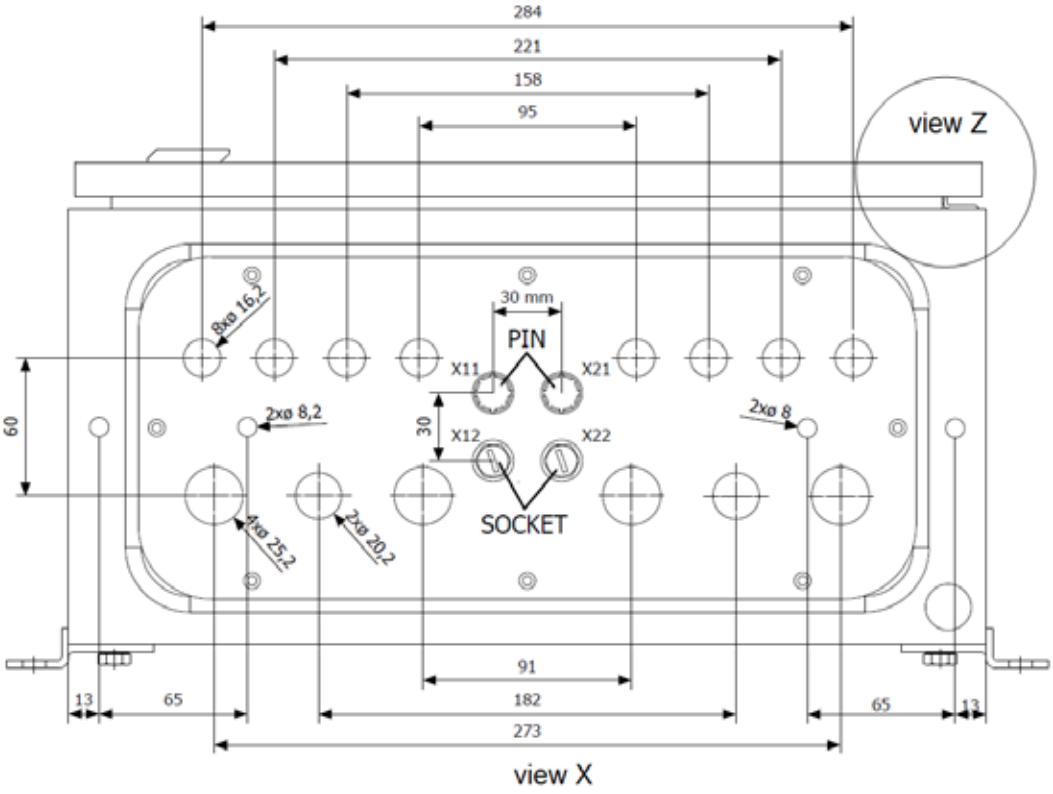
cut A-A



view B



view Z with open door

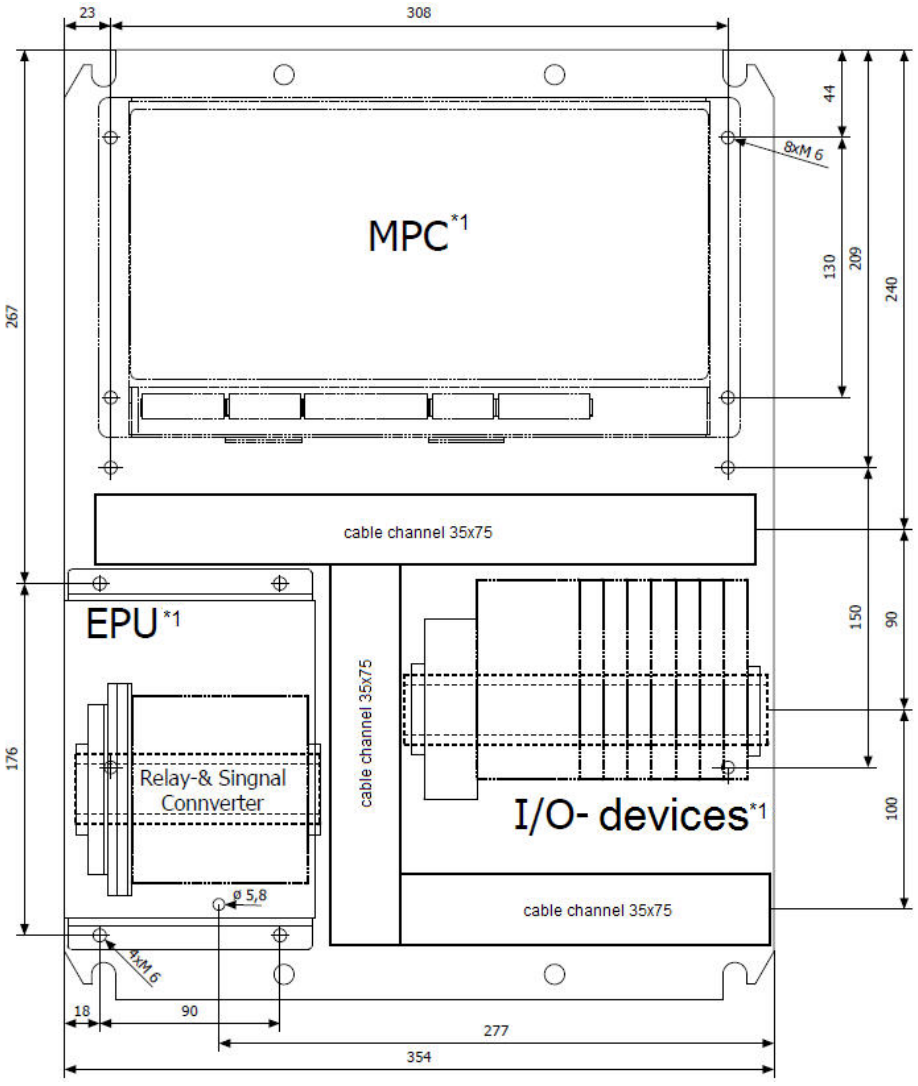


view X

The cutouts for the power supplies have to be closed with protective covers.
Any other cable ducts are not included in delivery.

Preassembled cabinet for Marex OS III

Technical drawing



*1) pictured devices are not included in delivery

EPU (External power unit)

Technical data

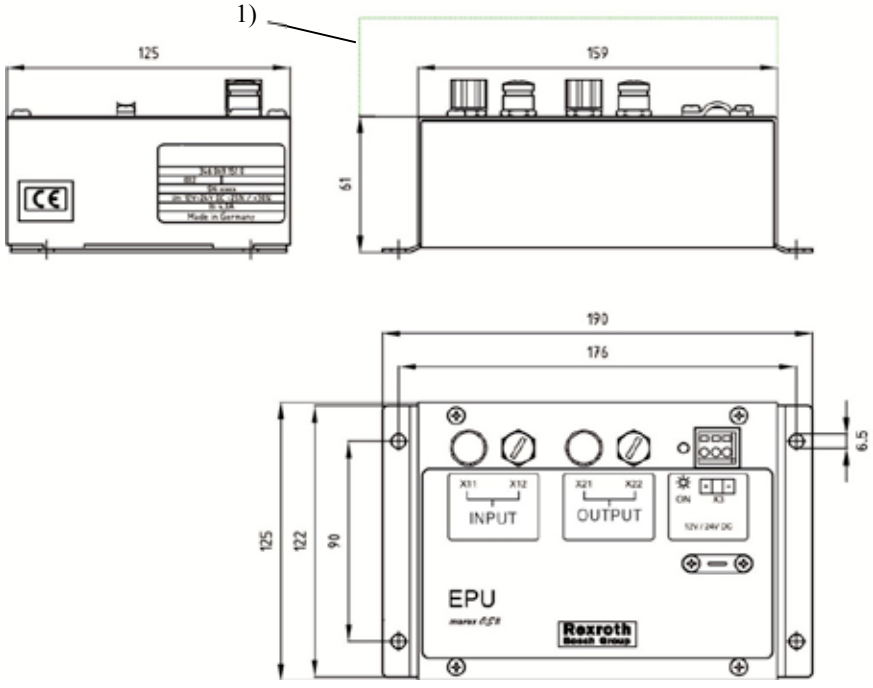
Function	For internal power supply via MPC
Operating voltage	12 V DC or 24 V DC -25% / +30%
Operation current	2.5 A
Operating temperature	-20°C to +70°C
Protection category	IP20 acc. to IEC 60529
Design	CAN bus compatible
Weight	1.2 kg

→ The EPU (External power unit)
is used as voltage supply for the control head 240 / 241 and the CAN operating modules. The supply voltage is fed into the data link which also transmits the CAN bus. Per engine is one EPU required.

Type numbers

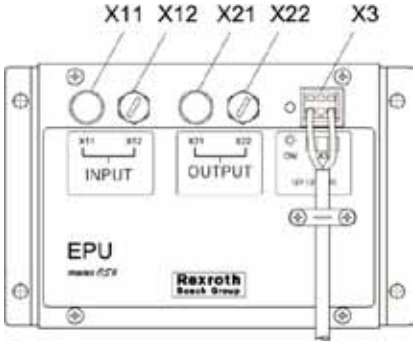
Device	Type number
EPU (External power unit)	346 069 151 0

Technical drawing



1) please provide additional space for wiring in the area of the M12-connectors 80 mm

Terminal assignment



Connection	Description
X11	Plug connection CAN bus input
X12	
X21	Plug connection CAN bus + power supply output
X22	
X3	Plug connection power supply

I/O devices – type 750

Technical data

EMC CE- interference resistance	Acc. to EN 60000-6-2 (2001)
EMC CE- transient emissions	acc. to EN 60000-6-2 (2001)
EMC Shipbuilding - interference resistance	acc. to Germanischer Lloyd (2001)
EMC Shipbuilding - transient emissions	acc. to Germanischer Lloyd (2001)

➔ The I/O devices – type 750
are designed as MPC control units. The devices must be installed in a control cabinet or panel. Marex OS III supports up to 64 DI, 64 DO, 4 AI, 4 AO per node (a maximum of 64 field terminals can be connected).

Type numbers

Design	Function	Colour code	Components	Type number
CAN coupler		grey	base	R419 800 470
CAN coupler	128 kB	grey	base	R419 800 471
CAN coupler	640 kB	grey	base	R419 800 526
Feed-In terminal		grey	base	R419 800 480
Filter terminal		grey	base	R419 800 481
End terminal	Bus	grey	base	R419 800 479
Input module	4 DI	yellow	digital input modules	R419 800 472
Input module	8 DI	yellow	digital input modules	R419 800 646
Input module	2 AI 0-20 mA	green	analog input modules	R419 800 473
Input module	4 AI 0-20 mA	green	analog input modules	R419 800 648
Input module	2 AI ±10 V DC	green	analog input modules	R419 800 949
Output module	4 DO PNP 500 mA	red	digital output modules	R419 800 475
Output module	2 DO CO 1 A	red	digital output modules	R419 800 476
Output module	8 DO PNP 500 mA	red	digital output modules	R419 800 647
Output module	2 DO NO 2 A	white	digital output modules	R419 800 768
Output module	2 AO 0-20 mA	blue	analog output modules	R419 800 477
Output module	4 AO 0-20 mA	blue	analog output modules	R419 800 649
Output module	2 AO ±10 V DC	blue	analog output modules	R419 800 950

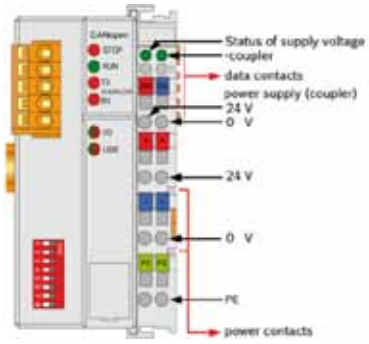
Accessories

Device	Type number
I/O terminal strip	R419 800 920
Software package (programming) and programming adapter	on request

I/O devices – type 750

Variant parts list

CAN coupler

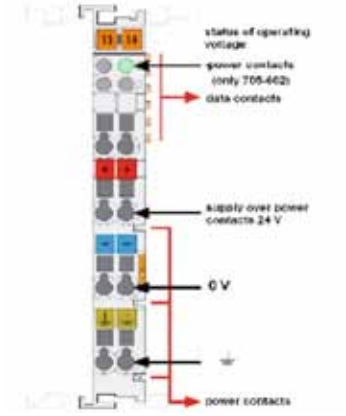


Technical data	R419 800 470	R419 800 471	R419 800 526
Function	coupler	coupler	coupler
Number of field terminals	64	64	64
Power supply	24 V DC (-15 %...+ 20 %)	24 V DC (-15 %...+ 20 %)	24 V DC (-15 %...+ 20 %)
Input current max.	500 mA with 24 V	500 mA with 24 V	500 mA with 24 V
Internal current consumption	350 mA with 5 V	350 mA with 5 V	350 mA with 5 V
Sum current for field terminals	1650 mA with 5 V	1650 mA with 5 V	1650 mA with 5 V
Potential isolation	500 V system / supply	500 V system / supply	500 V system / supply
Voltage over power contacts	24 V DC (-15 %...+ 20 %)	24 V DC (-15 %...+ 20 %)	24 V DC (-15 %...+ 20 %)
Dimensions B x H x T	51 mm x 65 mm* x 100 mm	51 mm x 65 mm* x 100 mm	51 mm x 65 mm* x 100 mm
Weight	app. 195 g	app. 195 g	app. 195 g
With integrated PLC	-	128 kByte	640 kByte

* from mounting rail's top edge

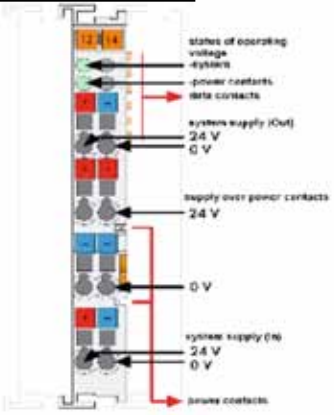
Terminals

R419 800 480



R419 800 479

R419 800 481



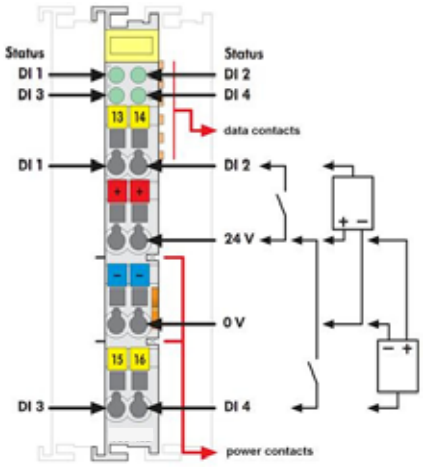
Technical data	R419 800 481	R419 800 479	R419 800 480
Function	filter terminal	end terminal	feed-In terminal
Voltage over power contacts	24 V DC (-25 % … + 30 %)	-	24 V DC
Current over power contacts max.	10 A DC	-	10 A DC
Current over system supply max.	1,5 A	-	-
Dimensions width	12 mm	12 mm	12 mm
Weight	app. 51 g	app. 35 g	app. 45 g
Information	an additional filter terminal is required for every further potential-isolated field range.	the termination fitting 750-600 is required for every type 750 node.	in the Marex OS III system the feed-in terminal 750-602 only serves to use field terminals having the power contact "earth" on their left side.

I/O devices – type 750

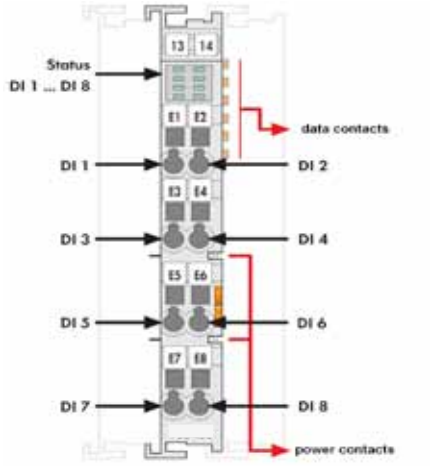
Variant parts list

Digital input terminals

R419 800 472



R419 800 646



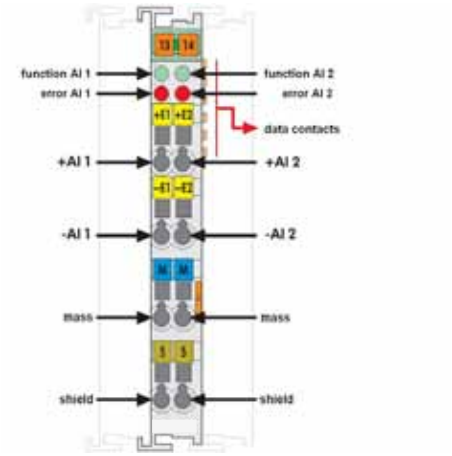
Technical data	R419 800 472	R419 800 646
Function	4 DI	8 DI
Number of inputs	4	8
Current consumption (internal)	7,5 mA	17 mA
Voltage over power contacts	24 V DC (-25 %...+ 20 %)	24 V DC (-25 %...+ 20 %)
Signal voltage (0)	-3 V … +5 V DC	-3 V … +5 V DC
Signal voltage (1)	15 V … 30 V DC	15 V … 30 V DC
Input filter	3,0 ms	3,0 ms
Input current typ.	4,5 mA	2,8 mA
Potential isolation	500 V system / supply	500 V system / supply
Dimensions width	12 mm	12 mm
Weight	app. 48,5 g	app. 48,5 g

I/O devices – type 750

Variant parts list

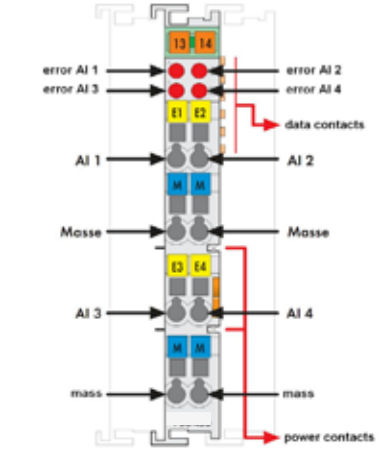
Analog input terminals

R419 800 473



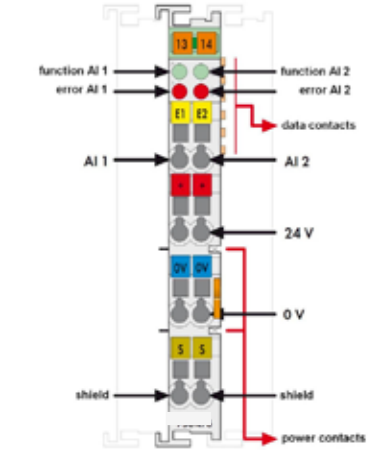
Technical data	R419 800 473
Function	2 AI
Number of inputs	2
Current consumption (internal)	70 mA
Power supply	via system internally DC/DC
Common-mode voltage max.	35 V DC
Signal current	0 mA … 20 mA
Input resistance	< 220 Ω / 20 mA
Resolution	12 Bit
Converting time typ.	2 ms
Potential isolation	500 V system / supply
Dimensions width	12 mm
Weight	app. 51 g

R419 800 648



Technical data	R419 800 648
Function	4 AI
Number of inputs	4
Current consumption (internal)	65 mA
Power supply	via system internally DC/DC
Common-mode voltage max.	32 V DC
Signal current	0 mA … 20 mA
Input resistance	< 100 Ω / 20 mA
Resolution	12 Bit
Converting time typ.	10 ms
Potential isolation	500 V system / supply
Dimensions width	12 mm
Weight	app. 51 g

R419 800 949



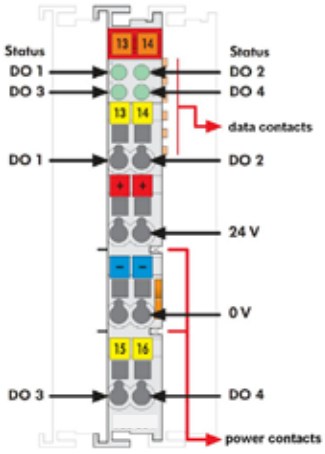
Technical data	R419 800 949
Function	2 AI
Number of inputs	2
Current consumption (internal)	75 mA
Power supply	via system internally DC/DC
Input voltage	24 V DC
Signal voltage	-10 V … +10 V
Input resistance	130 Ω
Resolution	15 Bit plus sign
Converting time typ.	80 ms
Potential isolation	500 V system / supply
Dimensions width	12 mm
Weight	app. 54,5 g

I/O devices – type 750

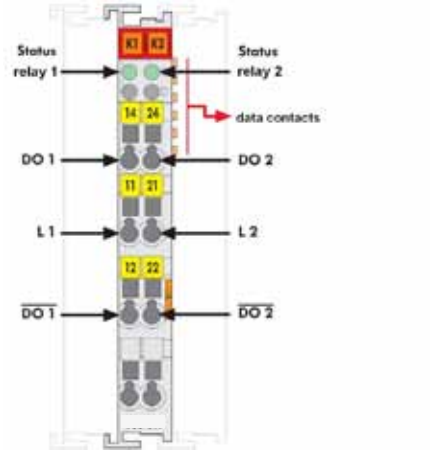
Variant parts list

Digital output terminals

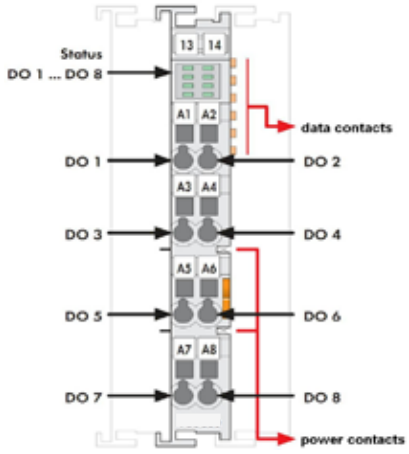
R419 800 475



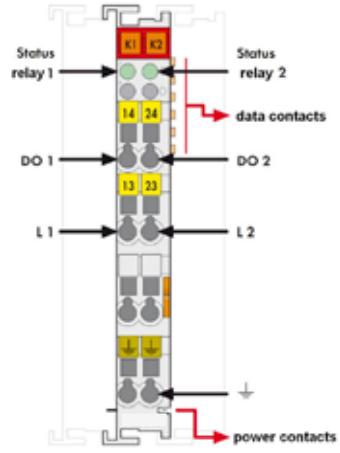
R419 800 476



R419 800 647



R419 800 768



Technical data	R419 800 475	R419 800 647
Function	4 DO	8 DO
Number of outputs	4	8
Current consumption (internal)	7 mA	25 mA
Voltage over power contacts	24 V DC (-25 % … +30 %)	24 V DC (-25 % … +30 %)
Load type	ohmic, inductive, lamp load	ohmic, inductive, lamp load
Output current max.	0,5 A short-circuit-proof	0.5 A short-circuit-proof
Current consumption typ. (field side)	30 mA / field terminal + load	15 mA / field terminal + load
Potential isolation	500 V system / supply	500 V system / supply
Dimensions width	12 mm	12 mm
Weight	app. 49,5 g	app. 48,5 g

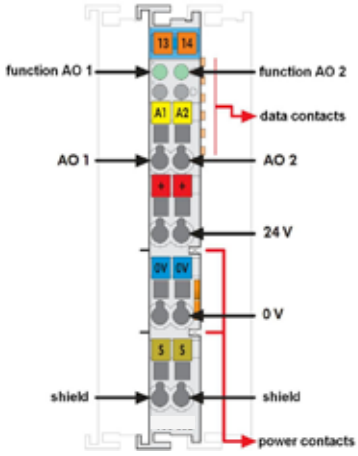
Technical data	R419 800 768	R419 800 476
Function	2 DO	2 DO
Number of outputs	2 normally open contacts	2 changeover contacts
Current consumption max. (internal)	100 mA	90 mA
Switching voltage max.	250 V AC / 30 V DC	250 V AC / 300 V DC
Switching power	500 VA / 60 W	-
Switching current min.	10 mA /5 V DC	100 mA (12 V DC)
Switching current max.	2 A AC / DC	1 A AC 1 A DC with 40 V 0,15 A DC with 300 V DC
Switching frequency	30 / min	6 / min
Data width (internal)	2 Bit	2 Bit
Potential isolation	1.5 kV effectively (field/system)	1.5 kV effectively (field/system)
Dimensions width	12 mm	12 mm
Weight	app. 53,5 g	app. 52,5 g

I/O devices – type 750

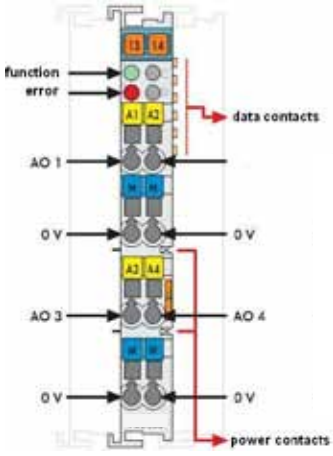
Variant parts list

Analog output terminals

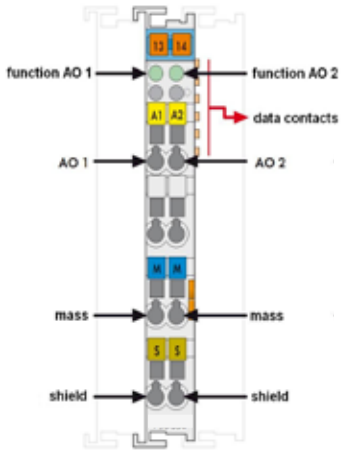
R419 800 447



R419 800 649



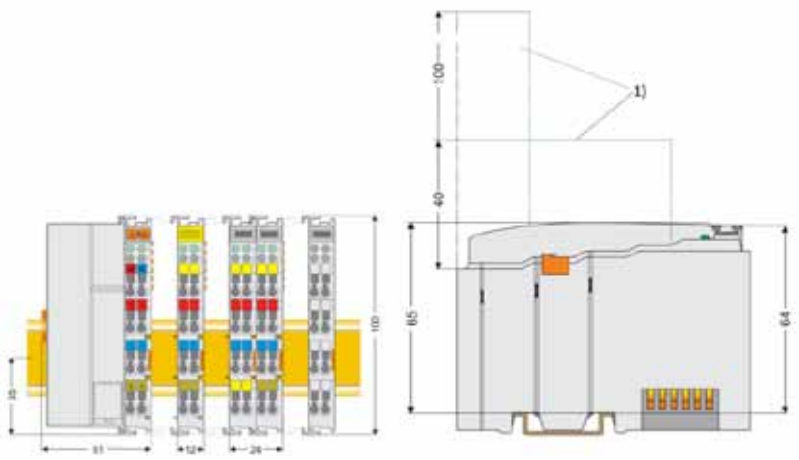
R419 800 950



Technical data	R419 800 477	R419 800 649	R419 800 950
Function	2 AO	4 AO	2 AO
Number of outputs	2	4	2
Current consumption (internal)	70 mA	60 mA	65 mA
Voltage over power contacts	via system voltage 24 V DC (-25 % … +30 %)	via system voltage 24 V DC (-25 % … +30 %)	via system voltage 24 V DC (-25 % … +30 %)
Signal current/voltage	0 mA … 20 mA	0 mA … 20 mA	-10 V … +10 V
Burden	< 600 Ω	0 ... 300 Ω or 300 … 600 Ω all channels must actuate the same burden range.	< 5 Ω
Resolution	12 Bit	12 Bit	12 Bit
Converting time typ.	2 ms	10 ms	2 ms
Current consumption typ. (field side)	15 mA / field terminal + load	-	-
Potential isolation	500 V system / supply	500 V system / supply	500 V system / supply
Dimensions width	12 mm	12 mm	12 mm
Weight	app. 53,5 g	app. 53,5 g	app. 50,5 g

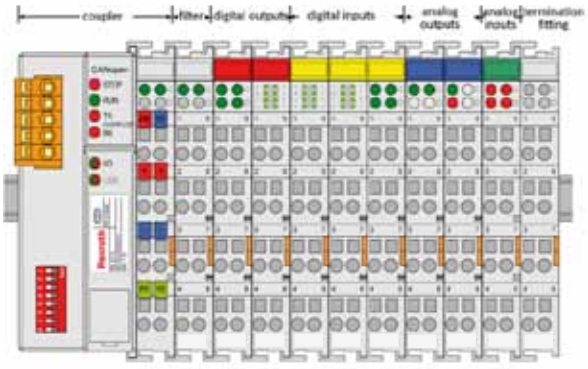
I/O devices – type 750

Technical drawing

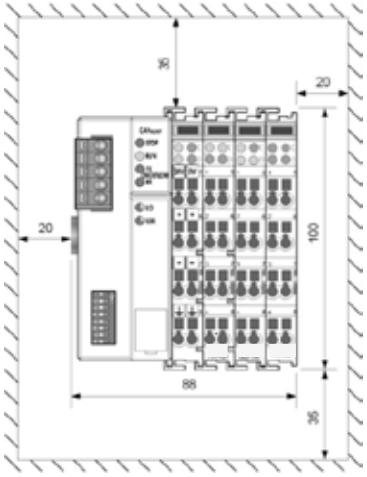


The illustration shows the standard coupler. For more details see the technical specifications.
1) please provide additional space for wiring in the area of the connections 40 mm and the CAN coupler 100 mm

Mounting sequence and installation conditions



It is recommended to keep the mounting sequence DO, DI, AO, AI, relays.



please provide additional space for wiring in the area of the connections as shown in the figure

I/O devices – configurable 3-way isolating amplifier

Technical data

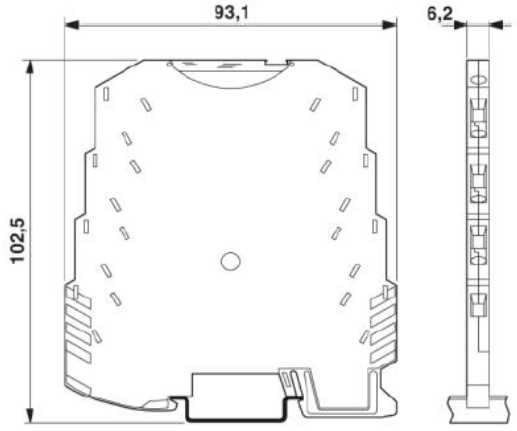
Function	Electrically isolate, condition, and filter analog signals
Supply voltage	19,2…30 V DC
Current consumption	24 V DC : <19 mA, Incl. 20 mA load current
Operating temperature	-20°C to +65°C
Step response (10…90%)	3,5 ms
Protection category	IP54 acc. to EN 60529
Cut-off frequency	100 Hz
Material	polybutylenterephthalate PBT, green

→ The configurable 3-way isolating amplifier
is designed as an electrically isolator, conditioner, amplifier and filter for the analog signals.

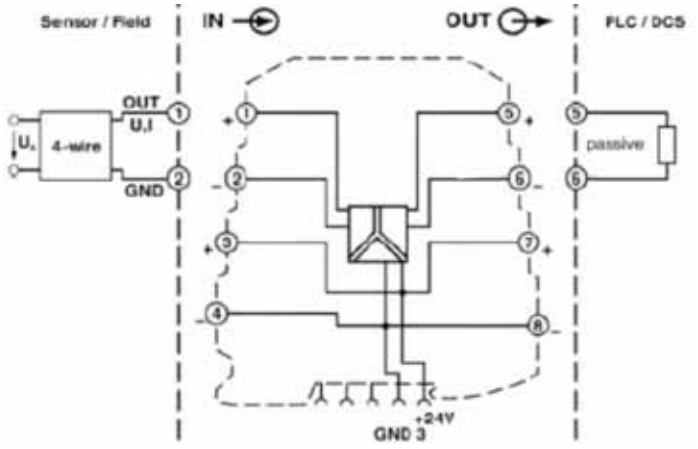
Type numbers

Device	Type number
Configurable 3-way isolating amplifier	R419 800 651

Technical drawing



Terminal assignment



Connection	Description
1	IN U, I
2	GND 1
3	+ 24V
4	GND 3
5	OUT U,I
6	GND 2
7	+24 V
8	GND 3

I/O devices – frequency converter

Technical data

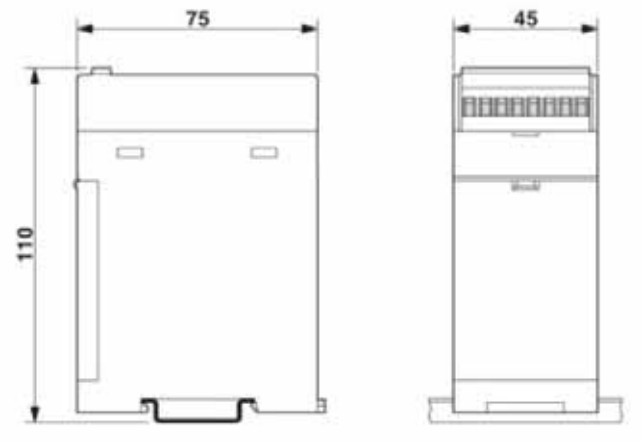
Function	Converts frequencies into analog signals, with 3-way isolation and configurable output
Range of supply voltages	20…30 V DC
Max. current consumption	< 60 mA
Operating temperature	-20°C to +65°C
Number of inputs	3
Frequency measuring range	0,1 Hz…120 kHz100
Design	ASA-PC (V0), green

→ MCR frequency measuring transducer
programmable, for converting frequencies into analog signals, with 3-way isolation and configurable output

Type numbers

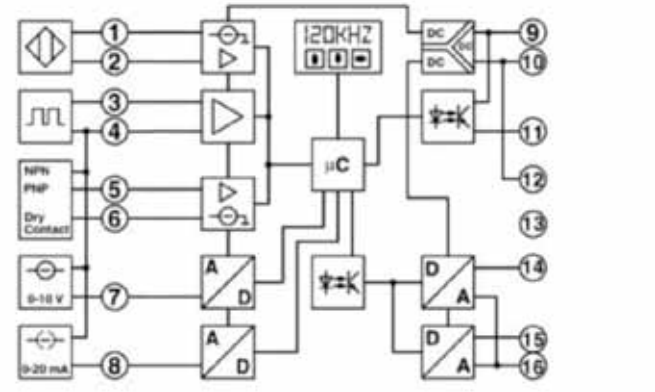
Device	Type number
MCR frequency measuring transducer	R417 000 605

Technical drawing



mounting position is optional; keep accessibility for parameterizing of device

Terminal assignment

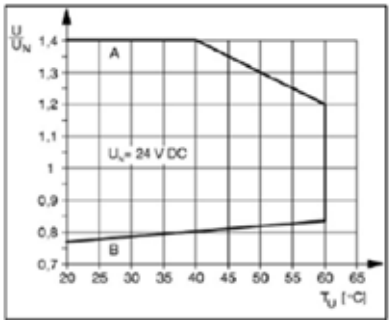


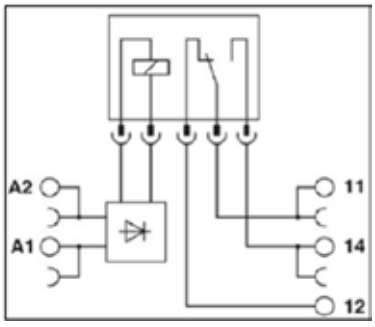
Connection	Description	Connection	Description
1	+8,2 V DC	9	+24 V DC
2	Namur in	10	GND
3	f in	11	SW
4	GND	12	GND
5	NPN/PNP	13	NC
6	+15 V DC	14	I OUT
7	U in	15	U OUT
8	I in	16	GND 2

I/O devices – relay

Relay coupler

R419 800 527

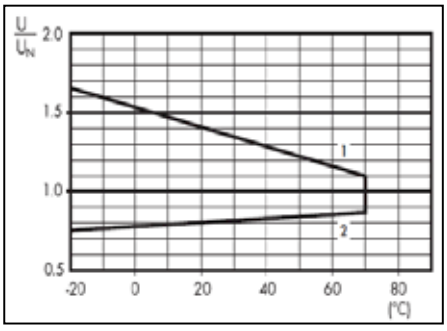


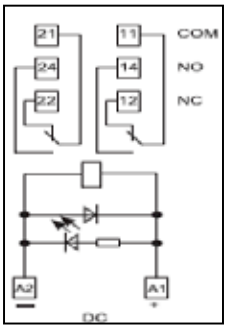


Technical data	
Nominal input voltage/ current	24 V DC / 9 mA
on coil side	250 V AC, DC / on
Max. switching voltage/ current	request
Min. switching voltage/ current	12 V AC, DC / 10 mA
Typical response time	5 ms
Typical release time	8 ms
Operating temperature	-20°C to +60°C
Protection	Polarity protection

Relay coupler R419 800 166

R419 800 166





Technical data	
Number of contacts	2
Nominal input voltage	24 V DC
Max. switching voltage/ current	250 AC / 8 / 15 or
Min. switching voltage/ current	12 V AC, DC / 10 mA
Typical response time	7 ms
Typical release time	12 ms
Operating temperature	-40°C to +70°C
Protection	IP 40

1) max. permitted coil voltage
2) min. pick-up voltage with coil at ambient temperature

Interface converter VDR (Voyage Data Recorder) CAN-NMEA 0183

Technical data

Function	Data transfer of remote control signals, which are required by classification societies to achieve the rules.
Supply voltage	24 V DC -25% / + 30%
Nominal current consumption	24 V DC: 500 mA
Operating temperature	0°C to +55°C
Vibration solidity	4g, (25 … 100 Hz), IEC 60068-2-6
Isolation strength	500 V DC
Applied EMC standards	EN 50081-1(01/92), EN 50082-2(08/95)
Protection category	IP20 acc. to IEC 60529
Weight	app. 0.2 kg

→ The interface converter VDR CAN-NMEA 0183
is designed for data transfer of remote control signals by NMEA 0183 bus signal. The VDR is required by class for specific type of vessel-rules of classification societies have to be checked. The protocol is normed and could be found under NMEA. org easy conversion of data from NMEA 0183 communication protocol into CAN bus network.

Type numbers

Device	Type number
Interface converter VDR (main module)	R419 300 351

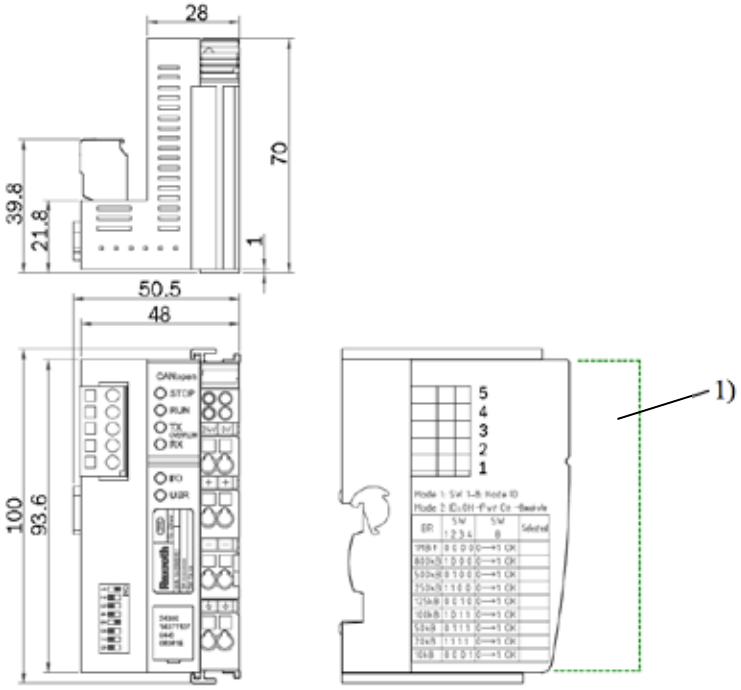
Accessories

Device	Type number
Filter module*	R419 800 481
RS422-Bus module*	R419 800 482
End module*	R419 800 479

* for operation necessary components

Technical drawing and pin assignment

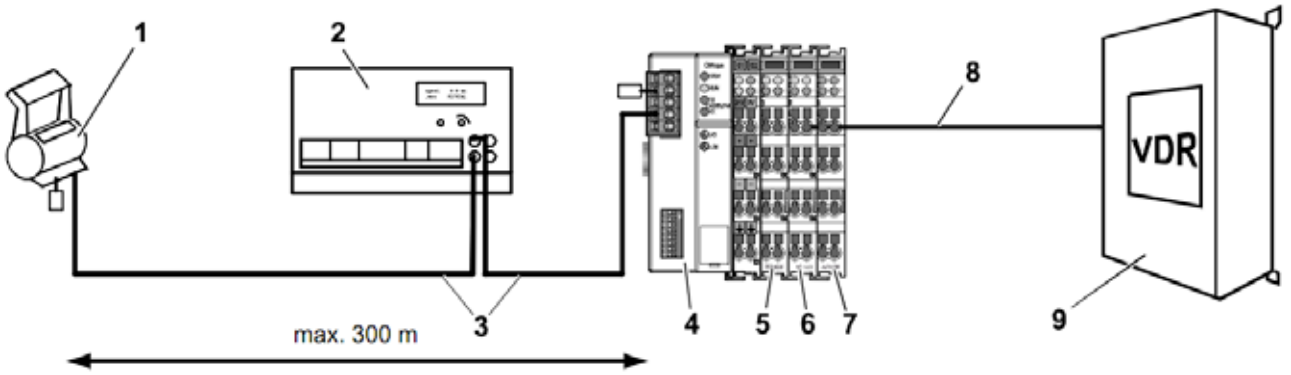
Pin	Description
1	CAN GND
2	CAN L
3	CAN shield
4	CAN H
5	n.c.



1) please provide additional space for wiring in the area of the connections 40 mm

Interface converter VDR (Voyage Data Recorder) CAN-NMEA 0183

Possible module connections



Number	Description	Remark
1	Control head	see separate page
2	Control unit MPC	see separate page
3	CAN-bus	see separate page
4	Interface converter VDR	R419 300 351
5	Filter module	R419 800 481
6	RS422-bus module	R419 800 482
7	End module	R419 800 479
8	RS422-bus	-
9	Voyage Data Recorder	-

Control unit pitch controller

Technical data

Function	Pitch controller
Supply voltage	24 V DC -25% / + 30%
Nominal current consumption	24 V DC: 500 mA
Operating temperature	0°C to +55°C
Vibration solidity	4g, (25 … 100 Hz), IEC 60068-2-6
Isolation strength	500 V DC
Applied EMC standards	EN 50081-1(01/92), EN 50082-2(08/95)
Protection category	IP20 acc. to IEC 60529
Weight	app. 0.2 kg

→ The control unit pitch controller
is designed for controlling the pitch of the controllable pitch propeller system.

Type numbers

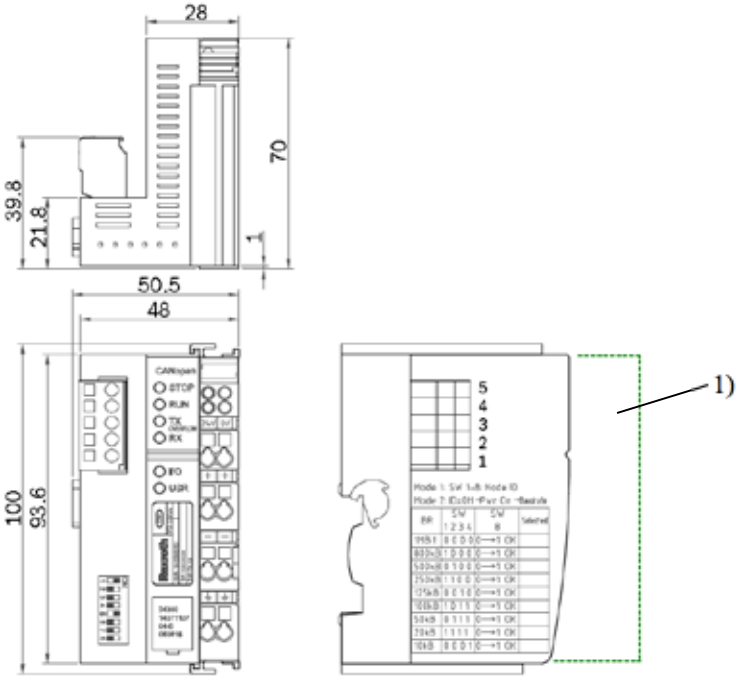
Device	Type number
Control unit pitch controller	R419 300 553

Accessories

Device	Type number
Filter module*	R419 800 481
8-channel digital output module*	R419 800 647
8-channel digital input module*	R419 800 646
4-channel analog output module*	R419 800 649
4-channel analog input module*	R419 800 648
End module*	R419 800 479

* for operation necessary component

Technical drawing and pin assignment

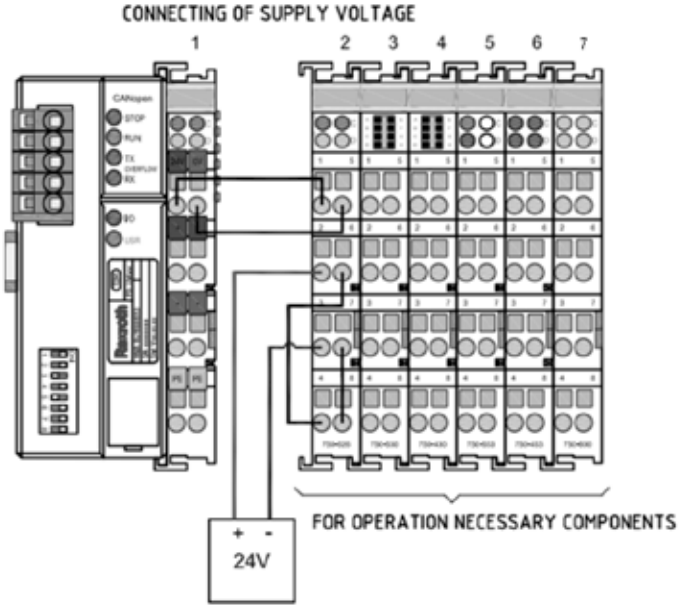


Pin	Description
1	CAN GND
2	CAN L
3	CAN shield
4	CAN H
5	n.c.

1) please provide additional space for wiring in the area of the connections 40 mm

Control unit pitch controller

Possible module connections



Number	Description	Remark
1	Pitch controller	R419 300 553
2	Filter module	R419 800 481
3	8-channel digital input module	R419 800 646
4	8-channel digital output module	R419 800 647
5	4-channel analog output module	R419 800 649
6	4-channel analog input module	R419 800 648
7	End module	R419 800 479

Multi-coupler I²C bus

Technical data

Function	Repeat the I²C bus signal
Supply voltage	24 V DC – 25 % / + 30 % or
Nominal current consumption	24 V DC : 0.6 A
Operating temperature	-20°C to +70°C
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Protection category	IP20 acc. to IEC 60529
Isolation strength	500 V AC
Design	modular
Weight	0.35 kg

→ The multi-coupler I²C bus
is designed as a repeating unit of the I²C bus system. If the maximum length of 2 m I²C bus is exceeded the multi-coupler is required.

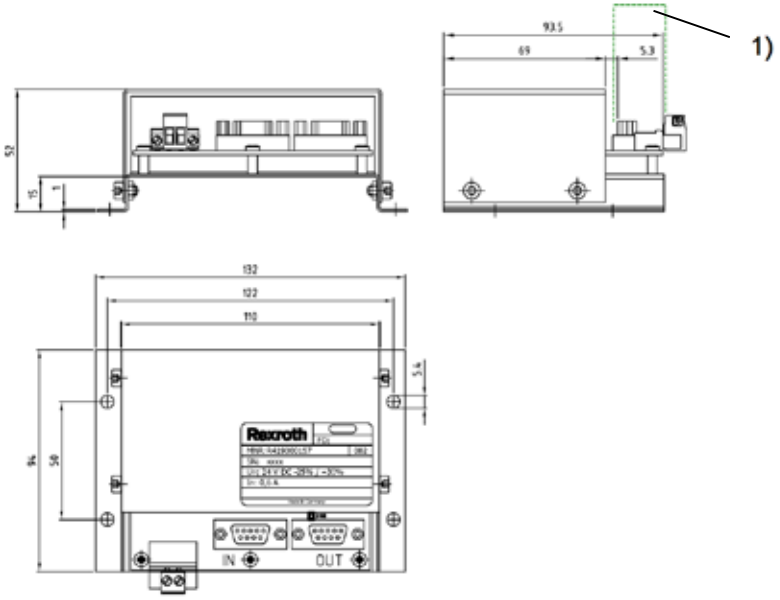
Type numbers

Device	Type number
Multi-coupler I²C bus	R419 300 157

Accessories

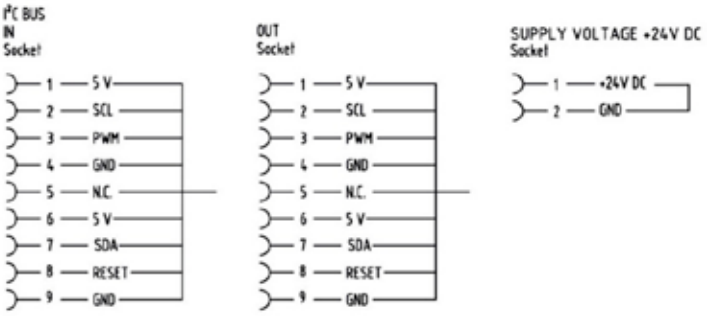
Device	Type number
I²C bus	see separate page

Technical drawing



1) keep accessibility for parameterizing of device; mounting position is optional, preferably as drawn

Terminal assignment



Back-up module – type 232

Technical data

Function	For fixed propeller systems
Supply voltage	18…32 V DC
Operating temperature	-20°C to +70°C
Protection category	above desk IP66 acc. to IEC 60529
Design	CAN bus suitable back-up control
Weight	see table below

→ The back-up module – type 232
is designed for emergency control of reversing gear propeller systems. By pressing the button for station transfer the command can be switched smoothless from main to emergency remote control. The command can be taken over on each station.

Type numbers

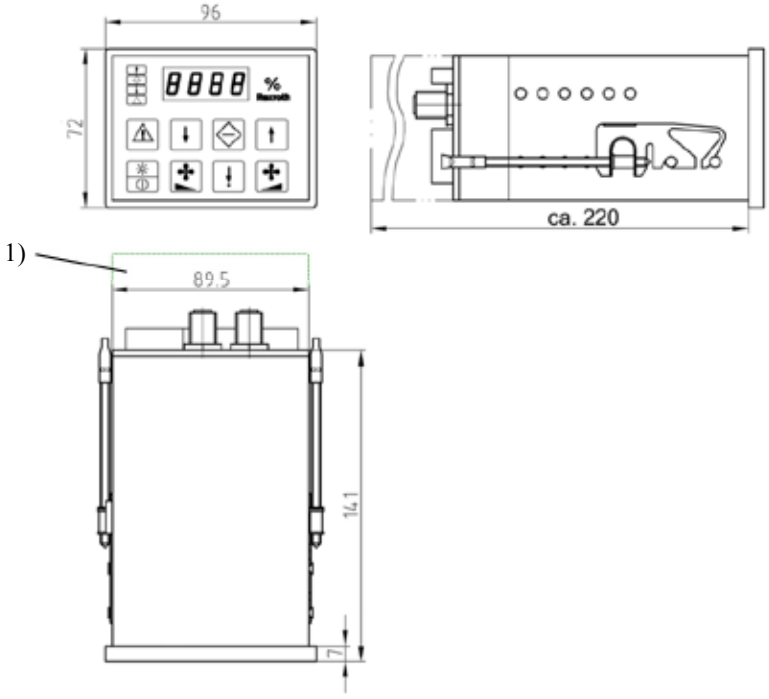
Device	Master/Slave	Number of engines	Weight [kg]	Type number
Back-up module – type 232	Master	1	0.5	362 232 000 0
	Slave	1	0.4	362 232 010 0

Accessories

Device	Description	Type number
CAN bus cable	-	see separate page
Relay unit reversing gear (RG) - modular	Relay unit to switch the out-/ingoing signals from main (mpc-modular) to emergency remote control	R417 000 511
Adapter	For connecting a second (third) slave module with emergency system	R419 800 372

software version and adjusted parameters (parameter list) are needed to repair or replace the module

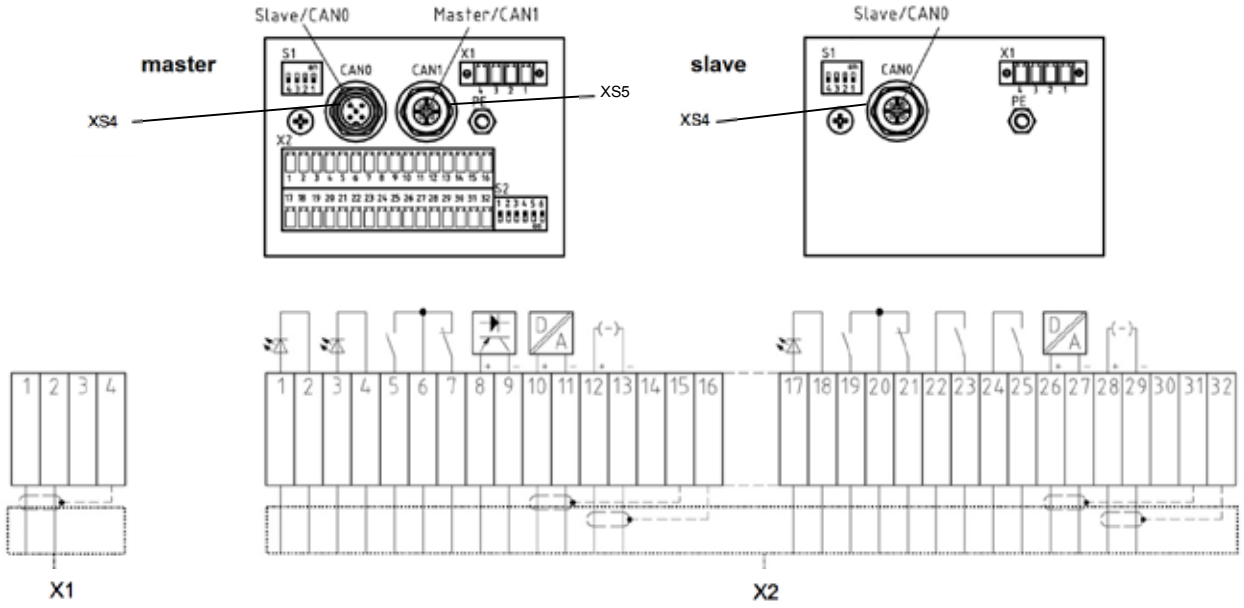
Technical drawing



Mounting position is optional, preferably as drawn.
1) please provide additional space for wiring in the area of the M12-Connectors 80 mm and the cable clamps 30 mm

Back-up module – type 232

Terminal assignment



Connection	Pin	Channel no.	Function		Description
X1	1 2	Vs+ Vs-	+ -	power supply	power supply of emergency module 24 V DC
	3	n.c.			
	4	PE		shield clamp	
X2	1 2	DI 1	+ -	ahead	digital feedback signal of gear box 6-32 V DC
	3 4	DI 2	+ -	astern	
	5 6 7	DO 1	NO GND NC	alarm	alarm
	8 9 10 11	AO 1	PWM - + -	rpm by PWM rpm by 4-20 mA	rpm setting 0-20 mA / 4-20 mA / 0-10 V / 7.5 – 92.5 % te
	12 13	AI 1	+ -	feedback rpm	0-20 mA / 4-20 mA
	14	n.c.			
	15 16	PE	shield clamp		
	17 18	DI 3	+ -	feedback command active	for transfer of command between remote control and emergency control
	19 20 21	DO 2	NO + NC	command active	
	22 23	DO 3	+ NO	ahead	reversing gear
	24 25	DO 4	+ NO	astern	
	26 27	AO 2	+ -	free	0-20 mA / 4-20 mA
	28 29	AI 2	+ -	feedback shaft speed	feedback signal of shaft speed 0-10 V / 0-20 mA
	30	n.c.			
	31 32	PE	shield clamp		
XS4		CAN0	internal CAN bus to connect a slave module		
XS5		CAN1	external CAN bus of master module to connect the master to the remote control		
S1					
S2			parameter setting of analog signal range		

Actuator

Technical data

Function	Actuator with internal electronic board
Supply voltage	24 V DC
Nominal current consumption	24 V DC : 4 A
Operating temperature	-25°C to +60°C
Protection category	IP54 acc. to IEC 529
Operating mode	S5 – 40 % DIN EN 60034-1
Nominal lifting force	100 N
Nominal lifting speed	70 mm/s
Nominal stroke	see table below
Weight	see table below

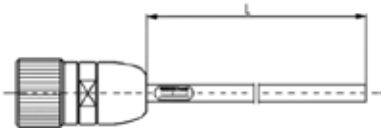
→ The actuator
will be needed if gear shifting, speed or pitch setting is realized by mechanical levers.

Type numbers

Device	Stroke [mm]	Weight [kg]	Type number
Actuator	70 *	1.8	323 698 100 0
	120 **	2.0	323 698 110 0

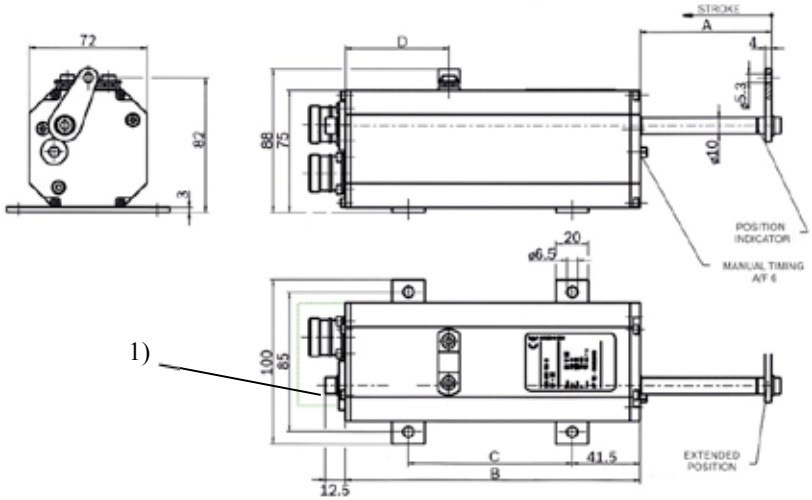
* standard for mechanical gear or speed setting
** for mechanical pitch setting where the propeller can be shifted to sailing position

Accessories



Device	Length [m]	Type number
Cable for signal (with two plugs to connect actuator to MPC-plus)	10	R417 000 523
Cable for signal (to connect actuator to MPC-modular and MPC-cabinet)	10	894 620 203 2
Cable for power supply	10	894 620 250 2

Technical drawing

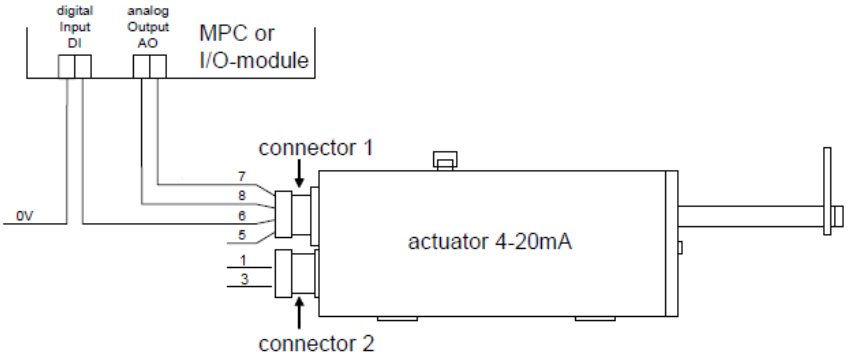


Stroke [mm]	A [mm]	B [mm]	C [mm]	D [mm]
70	80	180	100	63
120	130	230	150	60

Mounting position is optional, preferably as drawn.
1) please provide additional space for wiring in the area of the connections as shown in the figure

Actuator

Pin assignment



Plug 1 pin	Description
5	Relay contact errors, relay closed, in case of no errors
6	Relay contact errors, relay closed, in case of no errors
7	GND setpoint value control
8	4…20 mA setpoint value control, 4 mA retracted position

Plug 2 pin	Function	Description
1	24 V DC	Power Supply
3	0 V	

Actuator

Technical data

Function	Actuator with internal electronic board
Supply voltage	12 V DC
Nominal current consumption	12 V DC: 4 A
Operating temperature	-25°C to +60°C
Protection category	IP54 acc. to IEC 60529
Operating mode	S5 – 40 % DIN EN 60034-1
Nominal lifting force	100 N
Nominal lifting speed	70 mm/s
Nominal stroke	see table below
Weight	see table below

→ The actuator
will be needed if gear shifting, speed or pitch setting is realized by mechanical levers.

Type numbers

Device	Stroke [mm]	Weight [kg]	Figure	Type number
Actuator	70 *	1.8	1	323 698 020 0
	70 *	-	2	323 698 000 0
	120 **	2.0	1	323 698 010 0

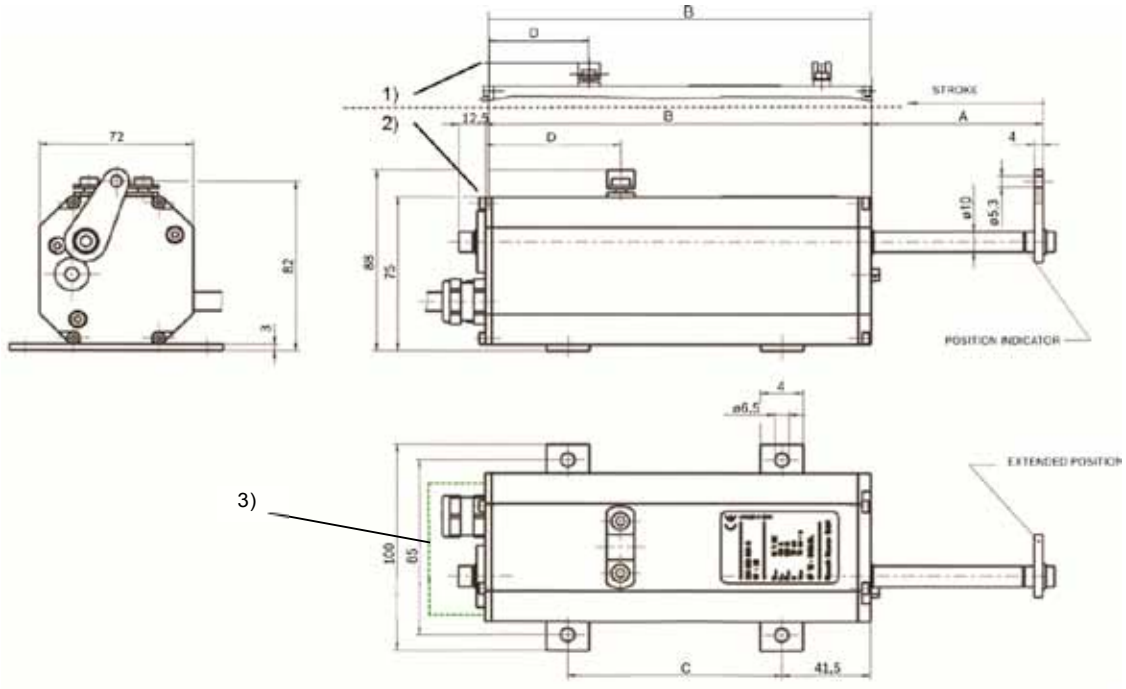
* standard for mechanical gear or speed setting
** for mechanical pitch setting where the propeller can be shifted to sailing position

Accessories

Device	Length [m]	Type number
Control unit***	see separate page	346 068 000 0

*** can control two actuators of these type via CAN bus. E.g. distance between actuator and MPC is > 600 mm

Technical drawing

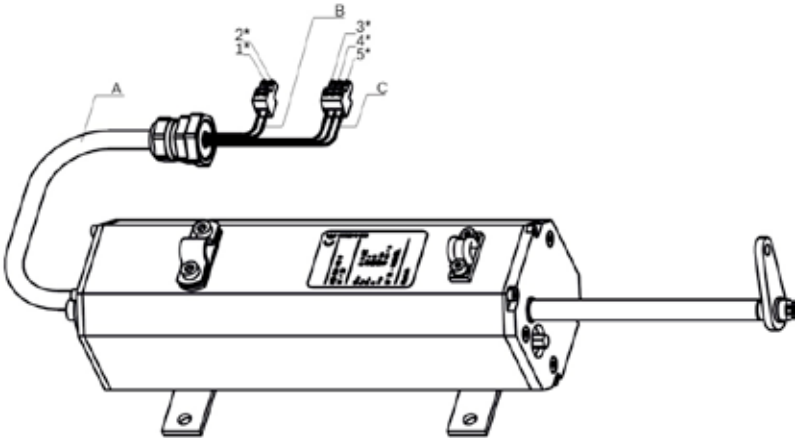


Stroke [mm]	A [mm]	B [mm]	C [mm]	D [mm]
70	80	180	100	63
120	130	230	150	60

1) 120 mm stroke, 2) 70 mm stroke, 3) please provide additional space for wiring in the area of the connections as shown in the figure

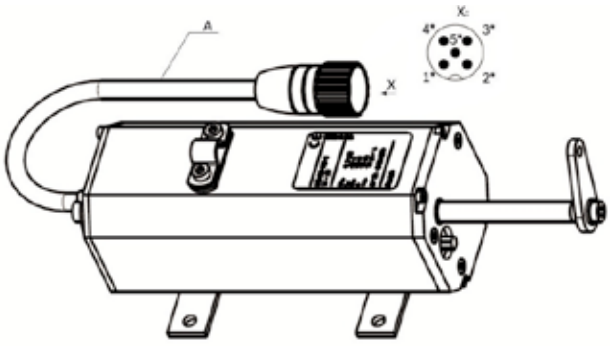
Actuator

Figure 1



*) see table below for pin assignments, A) length of schielded cable l= 600 mm, B) length of bared cable l=145 mm, C) length of bared cable l= 230 mm

Figure 2



*) see table below for pin assignments, A) distributing cable 5*1. 5 mm², l= 750 mm

Pin assignment

Pin	Cable color	Description
1	white	Motor +
2	brown	Motor –
3	green	Potentiometer +
4	yellow	Potentiometer slider
5	grey	Potentiometer -

Electro-pneumatic converter

Technical data

Function	Electrical remote control of pneumatic output
Supply voltage	24 V DC ± 20%
Nominal current consumption	app. 0.3 A
Operating temperature	-20°C to +65°C
Admissible medium	condensate-free and non-lubricated compressed air, filtered 50 µm
Supply pressure	8 bar
Output pressure	0 – 6 bar
Accuracy	max. 0.02 bar
Protection category	IP65 acc. to IEC 529
Vibration solidity	4g, (2 … 100 Hz), IEC 60068-2-6, test Fc
Material	Al-diecasting, NBR
Current control	4 – 20 mA, 0 – 20 mA
Voltage Control	2 – 10 V, 0 – 10 V
Resistor Control	5 – 10 kΩ
Weight	3.0 kg

→ The electro-pneumatic converter
is designed for electrical remote control of pneumatic output pressure by means of an electrical input signal. The electro-pneumatic converter will be needed where electrical control is required to act directly on a change of pressure or force.

Type numbers

Device	Nominal input value	Nominal input value alternative	Type number
Electro-pneumatic converter	4 – 20 mA *	0 – 20 mA	346 056 550 0
	0 – 10 V DC **	2 – 10 V DC **	
	5 – 10 kΩ **		

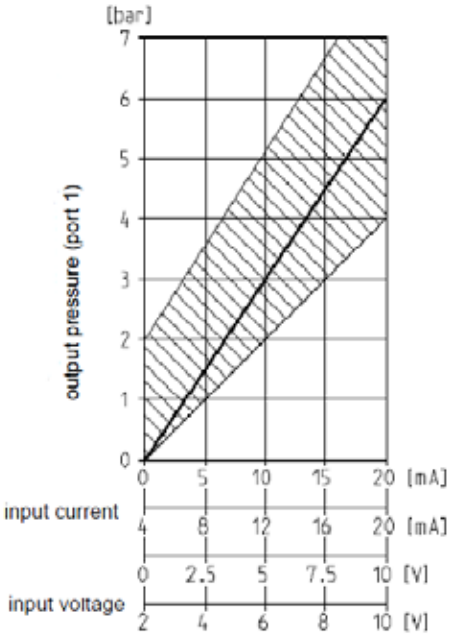
* characteristic adjusted by the factory
** change to voltage or resistor control by switch S on electronic printed circuit board

Accessories

Device	Type number
Repair kit (pneumatic part)	346 056 001 2
Electronic printed circuit board*	R419 300 451

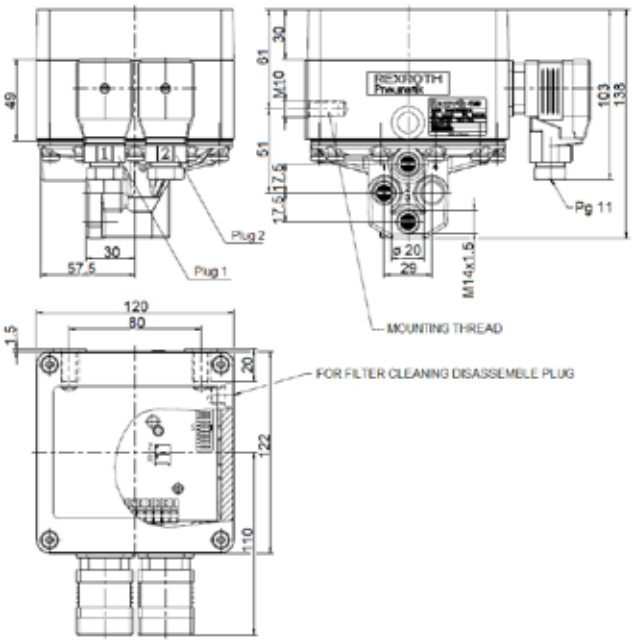
* only for EP-Control

Characteristic line



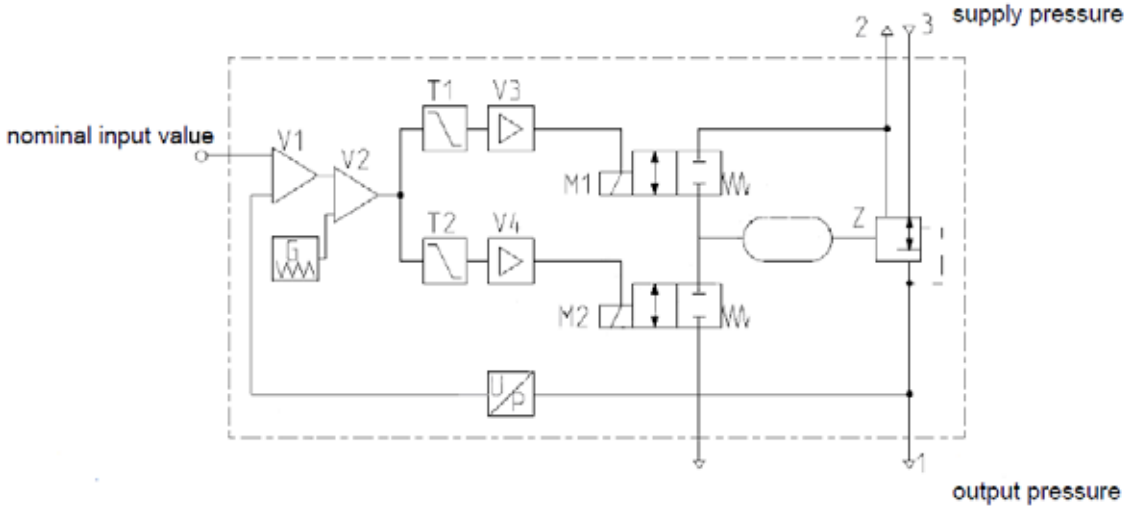
Electro-pneumatic converter

Technical drawing



The electro-pneumatic converter has to be mounted in a vertical position. Two threaded holes M10 are to be used for mounting.
Surveillance supply voltage and converter input signal has to be provided within the main control system.

Functional diagram

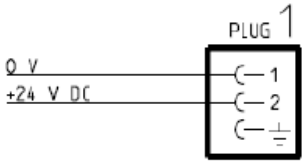


The electro-pneumatic converter modulates pressure corresponding to an analog electrical nominal value. The integrated electronics makes a comparison between the nominal value and the pressure in the working line (actual value), which is measured by a piezo-resistive pressure sensor. The converter generates electrical positioning signals, which either charge or vent control area Z of the relay valve by means of two pilot valves (M1, M2) in order to obtain the required pressure in the working line.

Electro-pneumatic converter

Pin assignment and switch position for current activation

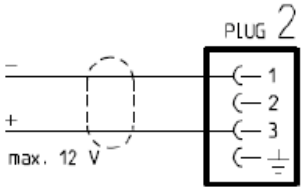
supply voltage



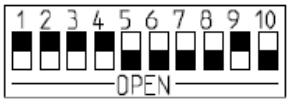
switch position of the multiple switch S:

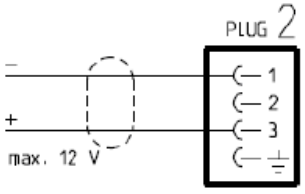
current control
4 .. 20 mA

(Delivery status)



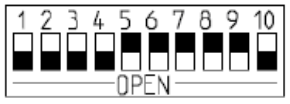
current control
0 .. 20 mA

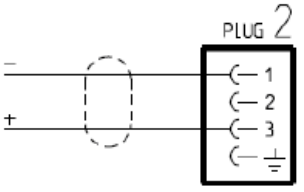




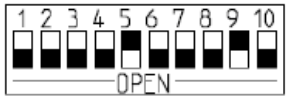
Pin assignment and switch position for voltage activation

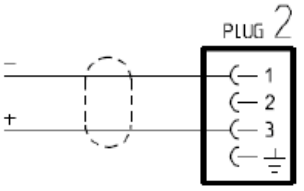
voltage control
2 .. 10 V





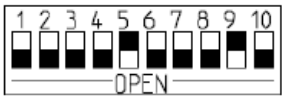
voltage control
0 .. 10 V

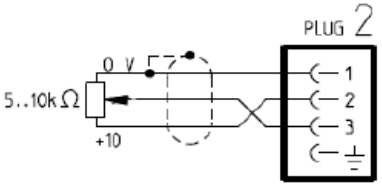




Pin assignment and switch position for potentiometer activation

potentiometer control
5 .. 10 k Ohm





to ensure the EMV plug 2 has to be connected through a screened cable

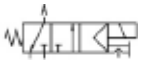
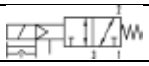
3/2-way solenoid valve

Technical data

Function	Electrical remote control of pneumatic components
Admissible medium	condensate-free and non-lubricated compressed air
Working pressure	8 bar
Nominal flow	1100 Nl/min
Supply voltage	24 V DC ± 20%
Nominal current consumption	190 mA
Operating temperature	-20°C to +70°C
Protection category	IP65 acc. to IEC 60 529
Duty cycle	100%
Design	slide valve
Material	Zn-diecasting, BUNA-N
Weight	0.85 kg

➔ The 3/2-way solenoid valve
is designed for pneumatic components which have to to be controlled by electronical signals. e.g. gear box, shaft brake, start and stop of the engine. Valve is non-overlapping. Monostable, ND7.

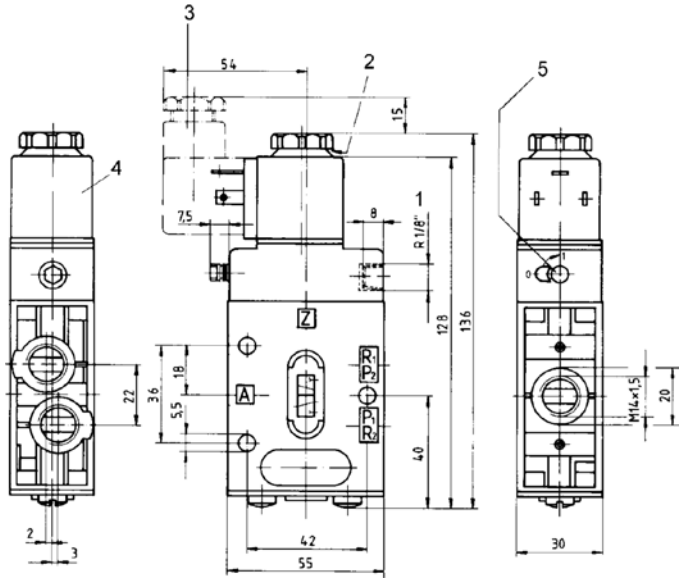
Type numbers

Symbol	Function	Pilot control	Operating pressure range	Connection thread	Type number
	NC	internal	3 – 10 bar	M14 x 1.5	372 352 222 0
	NO				372 354 222 0
	NC/NO	external	-0.95 – 10 bar/ pilot pressure min. 3 bar		372 353 222 0

Accessories

Device	Description	Type number
Plug connector	Plug connector with LED and protection diode against induced electromotive force	894 101 610 2
Spare part kit	Sealing and anker system of valve	372 352 000 2
Coil	Coil for 24 V DC ± 20%	542 070 702 2

Technical drawing

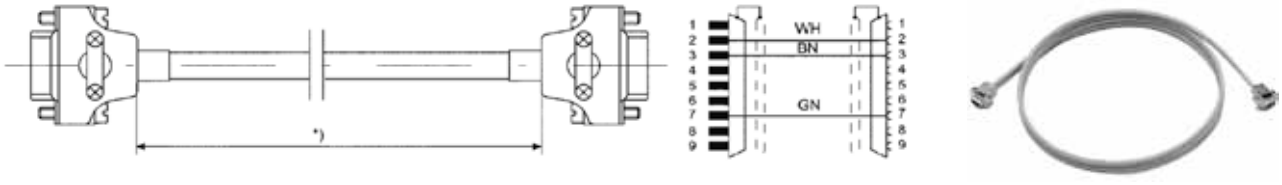


Nr.	Description
1	Only with separate pilot control G 1/8
2	After removal of cap - M5 internal thread
3	Plug can be fixed at 180° intervals
4	Coil can be fixed at 45° intervals
5	Manual override

keep accessibility for parameterizing of device

Cable equipped with sub-D plugs

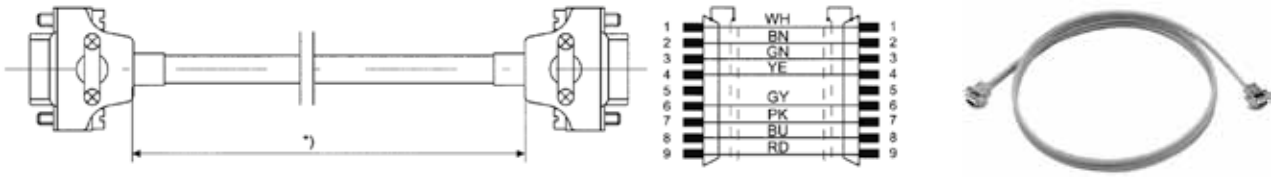
CAN bus cable with sub-D plug**



* cable length see table below
** connection between CAN bus devices equipped with sub-D plugs

Device	Length [m]	Type number
Shielded cable for CAN bus for devices with sub-D plugs	0.5	894 605 389 2
	2	894 605 446 2
	5	894 605 390 2
	10	894 605 391 2
	15	894 605 392 2
	20	894 605 393 2
	30	894 605 394 2
	40	894 605 395 2
	50	894 605 396 2
	60	894 605 445 2

I²C bus cable with sub-D plug***



* cable length see table below
** if the maximum length of 2 m I²C bus is exceeded, the multi-coupler I²C bus R419 300 157 must be installed
*** connection between control heads type 230 and operating / indication module type 231
or between operating / indication modules

Device	Length [m]	Type number
Shielded cable for I²C bus for operating / indication module type 231	0.3	894 605 388 2
	0.9	894 605 419 2
	1.5	894 605 495 2
	3	R419 800 628
	5	R419 800 867
	10	R419 800 329

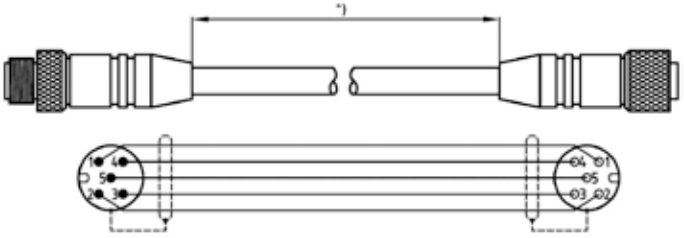
Sub-D plug with terminating resistor*

* for closing the CAN bus line

Device	Description	Type number
Plug with terminating resistor	male (with pins)	346 067 361 2
	female (with socket)	346 067 362 2

Cable equipped with M12 plugs

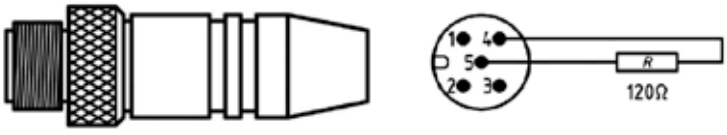
CAN bus cable with M12 plug**



* cable length see table below
** connection between CAN bus devices equipped with M12 plugs

Device	Length [m]	Type number
Shielded cable for CAN bus for devices with M12 plugs	0.5	894 605 479 2
	2	894 605 480 2
	5	894 605 481 2
	10	894 605 482 2
	15	894 605 483 2
	20	894 605 484 2
	30	894 605 485 2
	50	894 605 486 2
	80	894 605 487 2
	100	894 605 488 2

M12 plug with terminating resistor*



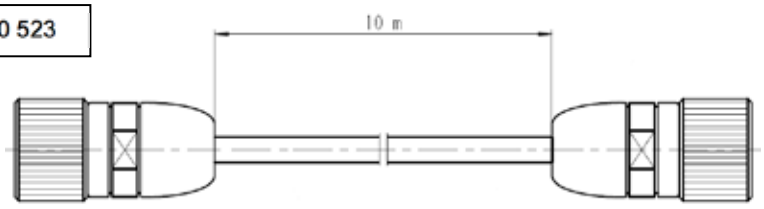
* for closing the CAN bus cable

Device	Length [m]	Type number
Plug with terminating resistor	male (with pins)	894 105 426 4
	female (with socket)	894 105 427 4

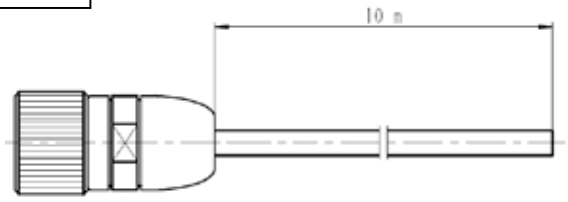
Connecting cable for actuators

Connecting cable

R417 000 523



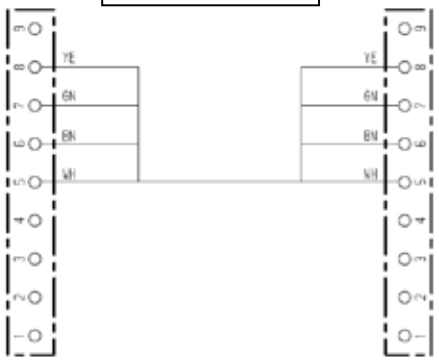
894 620 203 2



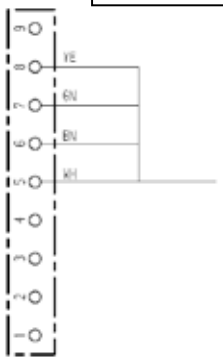
Device	Length [m]	Type number
Connecting cable for signal (with two plugs to connect actuator to MPC-plus)	10	R417 000 523
Connecting cable for signal (to connect actuator to MPC-devices)	10	894 620 203 2

Pin assignment

R417 000 523

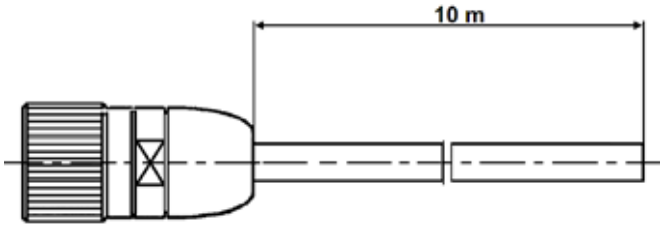


894 620 203 2



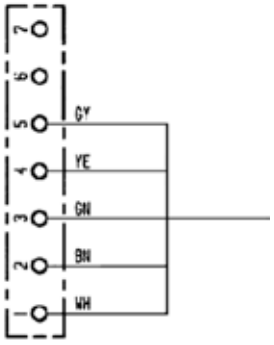
Connecting cable for actuators

Connecting cable



Device	Length [m]	Type number
Connecting cable for power supply	10	894 620 250 2

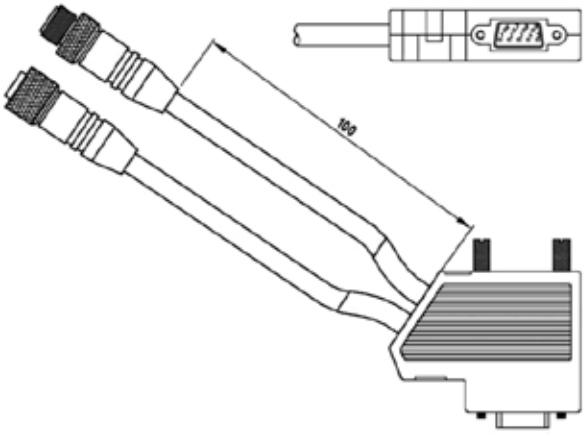
Pin assignment



Adapter

Adapter cable

Function	Connection between CAN bus devices equipped with sub-D or M12 plugs



Device	Type number
Adapter	894 605 489 2

Adapter cable

Function	Connection between CAN bus devices equipped with sub-D or M12 plugs

Fig. 1

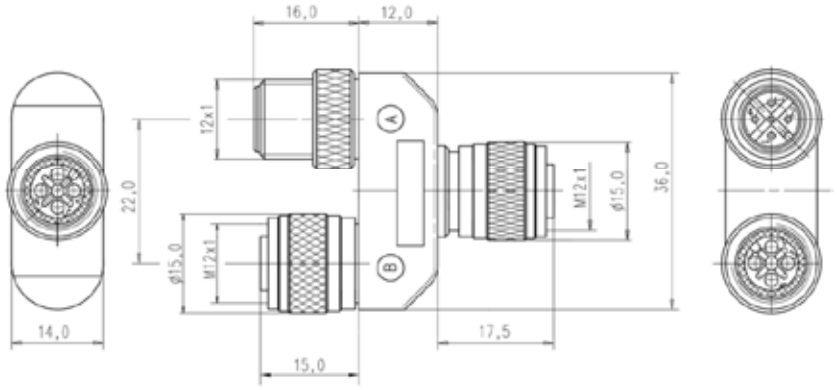
Fig. 2

Device	Figure	Type number
Adapter	Fig. 1	R419 801 214
Adapter	Fig. 2	R419 801 213

Adapter

Bus distributor – M12

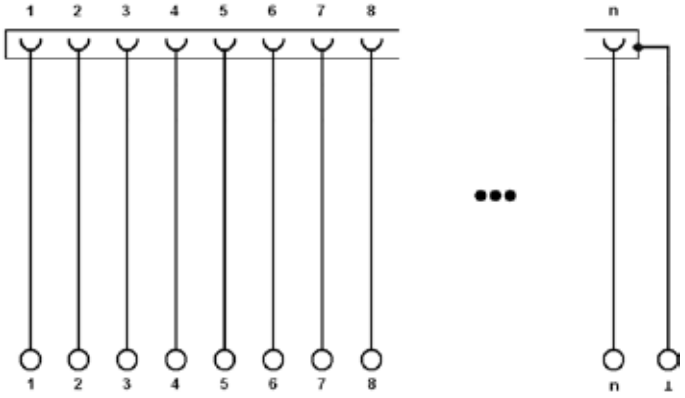
Function	Shielded distributor for e.g. emergency module with Sub-D or M12 plugs



Device	Description	Type number
Bus distributor for CAN bus	male to male (A) and female (B)	R419 800 372
Bus distributor for CAN bus	female to male (A) and female (B)	R419 800 162

Terminal block – sub-D

Function	Terminal block for connection of shielded data cable to prefabricated cables of Marex OS III

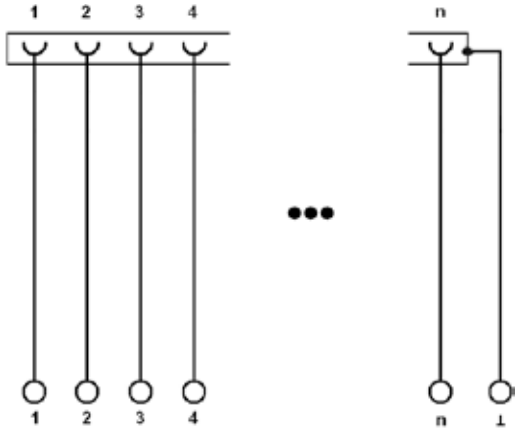


Device	Description	Type number
Adapter from 9-pin sub-D to terminal block	male (with pins)	894 305 894 2
	female (with socket)	894 305 895 2

Adapter

Terminal block – M12

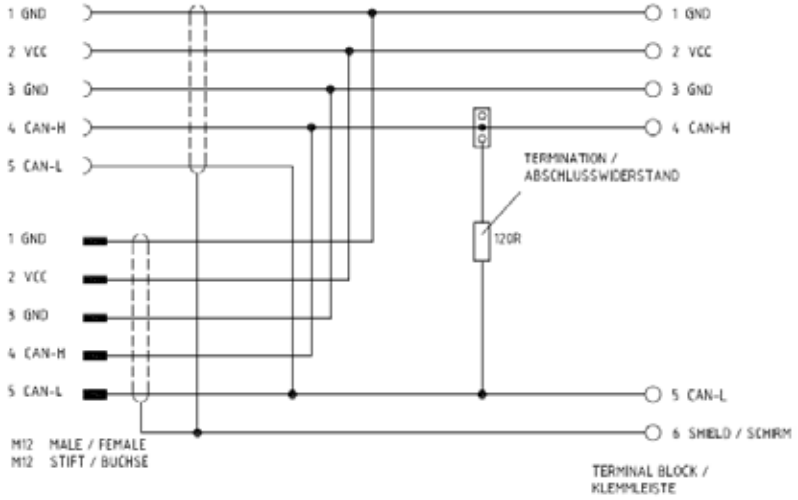
Function	Terminal block for connection of shielded data cable to prefabricated cables of Marex OS III



Device	Description	Type number
Adapter from M12 plug to terminal block	male (with pins)	R419 800 073
	female (with socket)	R419 800 072

Transfer element 2xM12 + 120 Ohm

Function	Connection between CAN bus devices

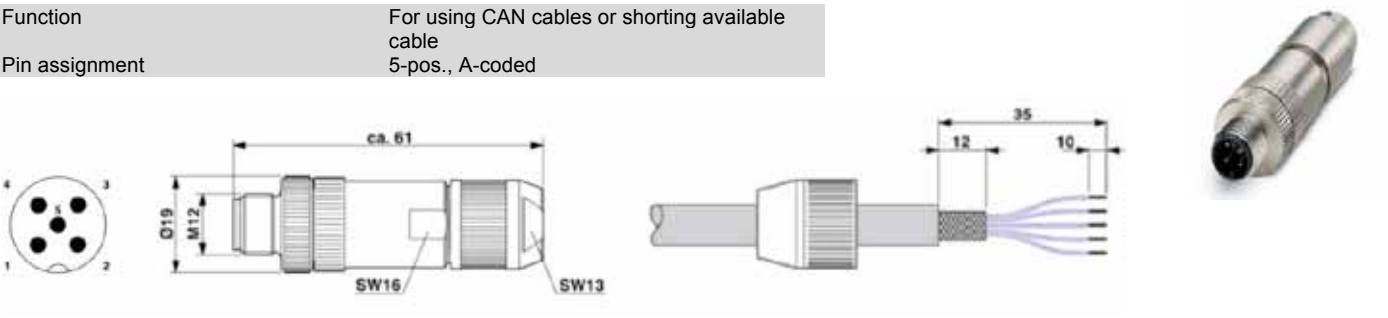


Device	Type number
Transfer element 2xM12 + 120 Ohm	R419 300 554

Adapter

M12 male plug

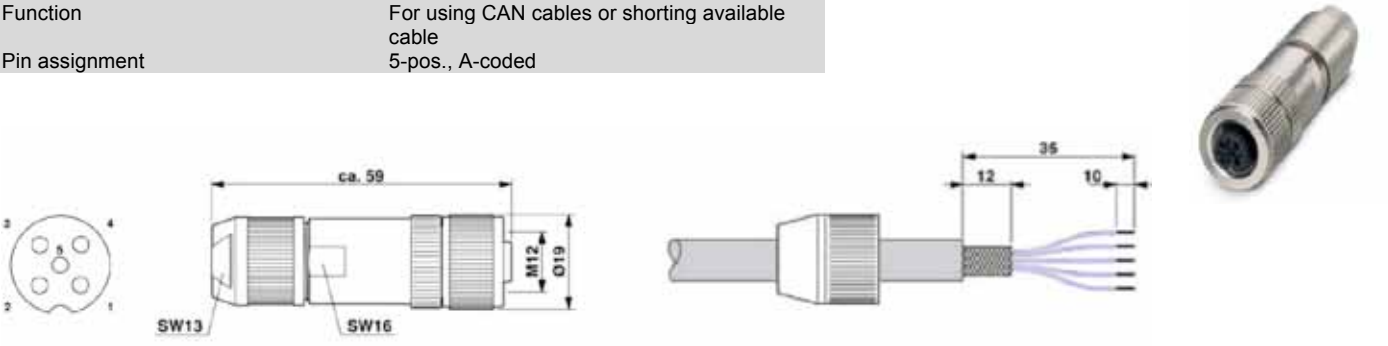
Function	For using CAN cables or shorting available cable
Pin assignment	5-pos., A-coded



Device	Type number
Male	894 105 430 4

M12 female plug

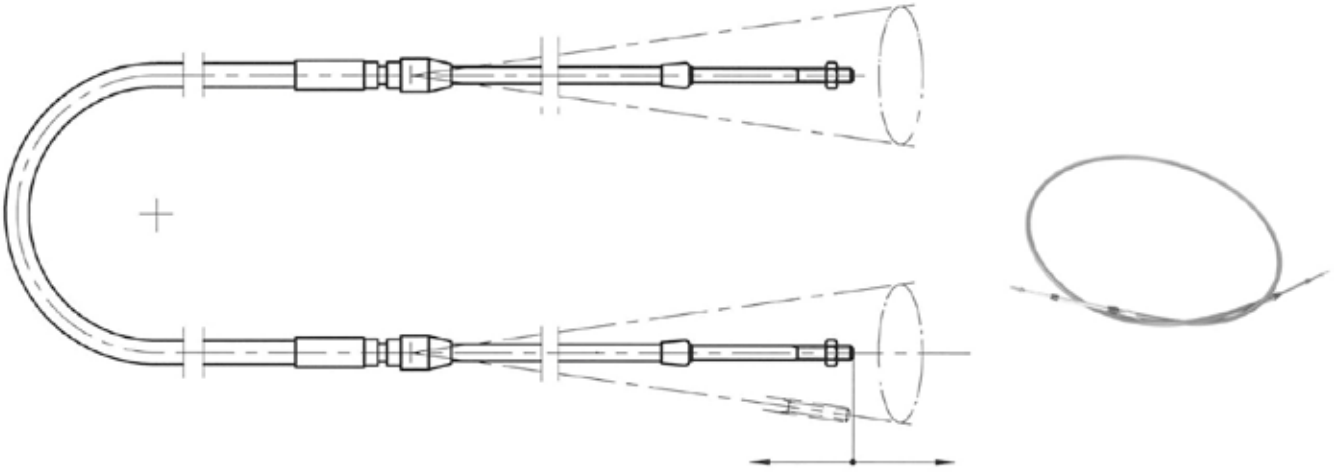
Function	For using CAN cables or shorting available cable
Pin assignment	5-pos., A-coded



Device	Type number
Female	894 105 429 4

Push-pull-cable

Push-pull-cable

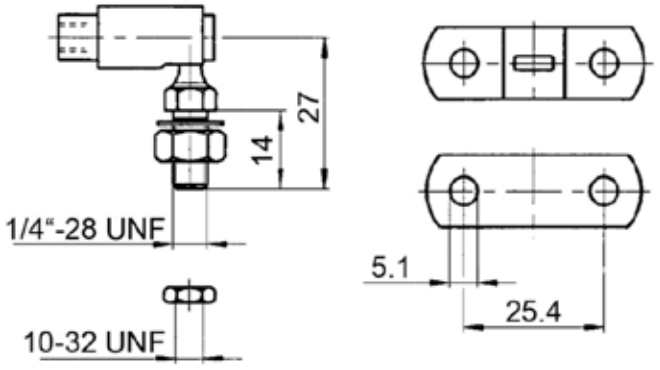


Device	Stroke* [mm]	Length [m]	Type number
Push-pull-cable	70	2	323 699 415 2
		3	323 699 416 2
	120	2	895 420 012 2
		3	895 420 013 2

* 70 mm is normal for mechanical gear or speed setting

Accessories

Device	Type number
Mounting kit	323 699 006 2



Protective sleeve

Technical data

Function	Protective sleeve for control heads type 240, type 241, type 244
Stable to	seawater, ultraviolet radiation, mineral oil and fat
Material	tyvek, synthetic leather (breathable)

→ The protective sleeve
is designed to protect the control head from water, oil or ultraviolet radiation.
The package comprises: - sleeve
- two synthetic bands
- two nylon clippers

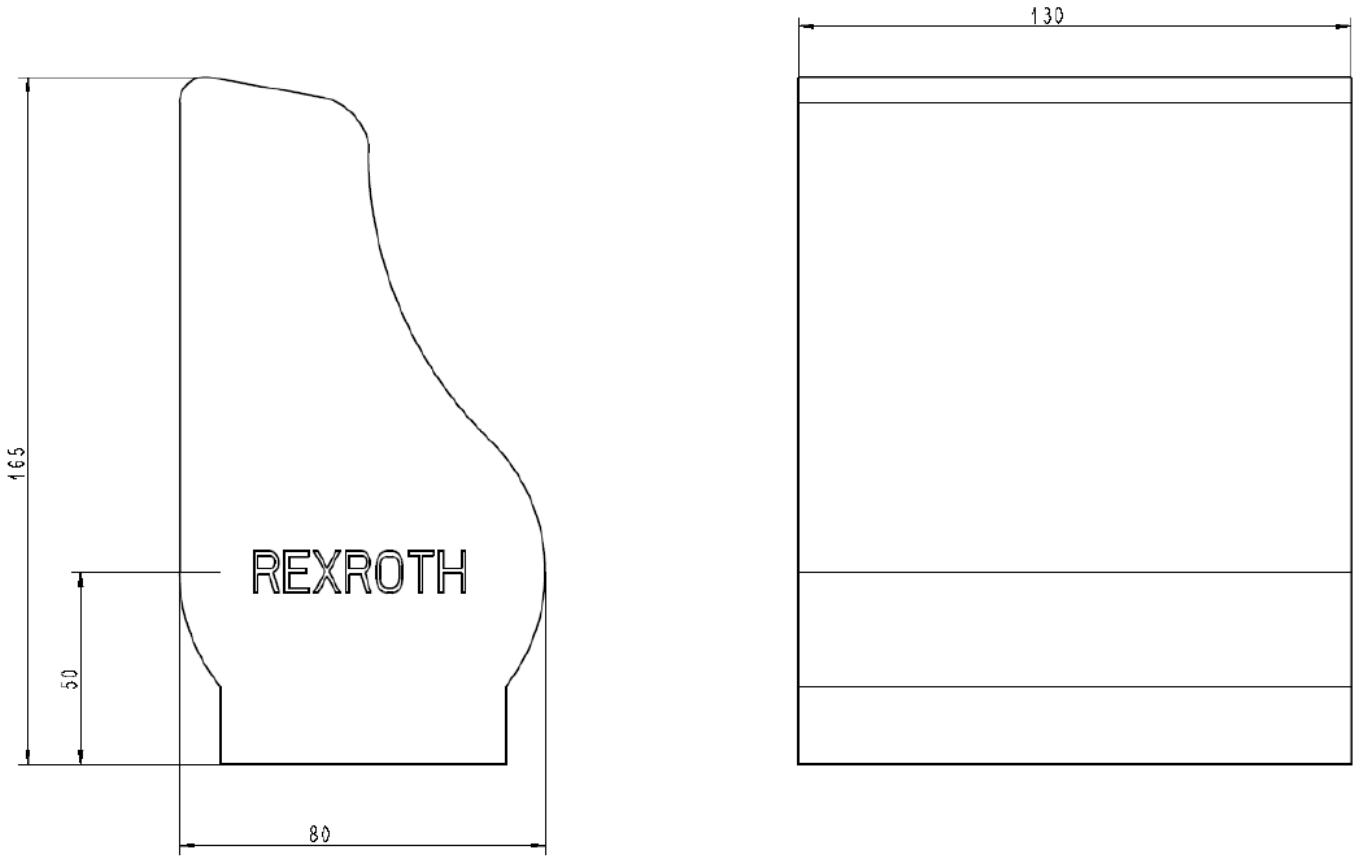
Type numbers

Device	Type number
Protective sleeve	R417 001 139

Compatibility

Device	Type number
Control head type 240	See separate page
Control head type 241	See separate page
Control head type 244	See separate page

Technical drawing



* sleeve is created for the control head type 240 (130 mm x 80 mm x 165 mm)

ParaEdit

Type numbers

Device	Type number
Software “ParaEdit 2.0”	R419 300 441
Service package “ParaEdit 2.0” with standard adapter	R419 300 326
Service package “ParaEdit 2.0” with advanced adapter	R419 300 325

Contents

Software	Description	Quantity
Software “ParaEdit 2.0”	CD-Rom	1

Service package “ParaEdit 2.0” with standard adapter	Description	Quantity
Interface module	PC CAN to USB ISO	1
Software “ParaEdit 2.0”	CD-Rom	1
Connection cable	CAN-bus M12 - SUB-D	1
Bus-splitter	CAN bus/ST	1
Connection cable	M12 0.5 m	1
User guide	DE/EN	1

Service package “ParaEdit 2.0” with advanced adapter	Description	Quantity
Interface module	USB to CAN II	1
Software “ParaEdit 2.0”	CD-Rom	1
Connection cable	CAN-bus M12 - SUB-D	2
Bus-splitter	CAN bus/ST	2
Adapter cable	Y-CAN	2
Connection cable	SUB-D CAN 2 m	2
Connection cable	M12 0.5 m	2
User guide	DE/EN	1

Notes:

Date:

Notes:

Date:

Notes:

Date:

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