Service

1/30 RE 64283/06.05

High pressure Load-Sensing control block of sandwich plate design

Type M4-15

Size 15 Component series 2X Nominal pressure 350 bar (pump side) Nominal pressure 420 bar (actuator side) Maximum flow - Pump side: 300 L/min with central inlet element

- Actuator side:

200 L/min with lateral inlet element 200 L/min with load-holding function 190 L/min with pressure compensator 150 L/min with pressure compensator & load-holding function



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Features

System

- Load pressure-independent flow control
- Open Center for fixed displacement pump
- · Closed Center for flow-controlled pump

Design

- Sandwich plate design
 - Inlet element
 - Up to 9 directional valve elements
 - Up to 18 directional valve elements with central inlet element
 - End element

Features

- Types of operation
- Mechanical (moving hand lever)
- Hydraulic
- · Electrohydraulic (switching, proportional)
- Electrohydraulic with on-board electronics (OBE)

Flow

- Load pressure-compensated
- High repeatability
- Low hysteresis
- Can be adjusted via stroke limiter

Pressure relief function

- Inlet element
- · Pilot operated pressure control valves of large nominal width
- Directional valve element / actuator ports
- · Compact shock valves with anti-cavitation function
- LS pressure limitation
 - · Adjustable for each actuator port
 - · External pressure adjustment possible for each actuator port
 - Electro-proportional per section

Fields of application

- Rock crushers

- Cranes
- Drilling equipment - Large and telescopic fork lifts - Truck applications
 - Municipal vehicles
- Forestry machines - Stationary applications

Function, section



Control block M4-15

The directional valves are proportional valves according to the Load-Sensing principle.

Actuator control

Main spool (2) determines the direction and the amount of flow that is directed to the actuator ports (A or B).

Pressure reducing valves (9) control the position of the main spool (2). The intensity of the electric current on the pressure reducing valve determines the amount of the pilot pressure in spring chambers (8) and hence the stroke of the main spool $(P \rightarrow A; P \rightarrow B).$

Pressure compensator (3) keeps the pressure differential across main spool (2) and consequently the flow to the actuator constant.

Load pressure compensation

Pressure changes in the actuators or the pump are corrected by the pressure compensator (3). The flow to the actuator remains constant even under differing loads.

Flow limitation

The maximum flow can be adjusted mechanically and individually by means of stroke limiters (6).

Pressure relief function

The LS pressure per actuator port can be influenced internally by means of LS pressure relief valves (4) or externally via LS ports M_A, M_B.

Pressure relief/anti-cavitation valves (5) protect actuator ports A and B from pressure peaks and from external forces.

The highest load pressure is signalled to the pump via the LS line and integrated directional valves (7).

Symbol

Deute				4	•	0 = 0			
Ports	Pump	Р	X Y LS	4	2	6 5.2	2 5.1	Ţ	
A, B	Actuators	B				$\neg $))			
т	Tank					, T \		ΙI	
х	Pilot oil supply			╩ _{──} ℊᡛᠲ╯┥		·	≷⊷		MA
Y	Pilot oil drain				∳ -	┝┟		-++	() M
LS	Load Sensing (LS)	A		₽ ~ "b"		┟ᡖ╶╌┟═┲╸		†	wВ
М _А , М _В	External LS ports	9		'a" ''	 m <u></u>				
		7		} 	 • • •	<u> </u>			-3

♦<u>|</u>|; ;

Technical data (for applications outside these parameters, please consult us!)

General							
Installation of	orientation			Optional			
Type of con	nection			Pipe thread to ISO 228/1			
Weight	Inlet elem	nent (lateral)		kg	7		
	Inlet elem	nent with priority val	ve	kg	10		
	Central ir	nlet element		kg	8.5		
	Direction	al valve element, hy	draulic	kg	7.1		
	Direction	al valve element, ele	ctrohydrauli	c kg	7.5		
	End elem	ient		kg	5.8		
Hydraulic flu	uid and ambie	ent temperature ran	ge ϑ	°C	-20 to +80		
Hydraulic	;						
Flow		Port P	q _{Vmax}	L/min	300 with central inlet element		
			· vilida	L/min	200 with lateral inlet element		
		Port A, B	q _{Vmax}	L/min	150 with pressure compensator and load-holding function (version "S")		
			, villax	L/min	190 with pressure compensator, without load-holding function (version "T")		
				L/min	200 without pressure compensator (version "C")		
Nominal pre	essure		<i>p</i> _{nom}	bar	350		
Operating p	pressure max.	Р	р	bar	350		
in port		А, В	р	bar	420		
		LS	р	bar	330		
		Т	р	bar	30		
		Y	р	bar	At zero pressure to tank		
Pilot pressu	re max.	Х	р	bar	35		
in port		a, b	р	bar	35		
Pilot pressu	re range	Hydraulic	р	bar	8.5 to 22.5		
		Electrohydraulic	р	bar	6.5 to 17.2		
Required co	ontrol Δp	Versions S; C	р	bar	18		
across cont	rol block	Version T	р	bar	25		
Recommend	ded hydraulic	pilot control device	es		TH 6, characteristic curve 97, see RE 64552		
LS pressure	limitation (ad	djustment ranges)		bar	50 to 149; 150 to 330 (selected in the factory)		
Hydraulic flu	uid				Mineral oil (HL, HLP) to DIN 51524, other hydraulic fluids, e.g. HEES (synthetic esters) to VDMA 24568 and hydraulic fluids as specified in RE 90221 on enquiry		
Viscosity rai	nge		ν	mm²/s	10 to 380		
Max. permissible degree of contamination of the hydraulic fluid - cleanliness class to ISO 4406 (c)					Class 20/18/15; for this, we recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$		
Electrical							
Electrical pilot control valves					FTWE 2 K; see RE 58007 FTDRE 2 K; see RE 58032		
Recommend (further con	ded amplifiers trol options o	s n enquiry)			MHVA2A1X/GF; 1 axis, see RE 29875 MHVA8/12B1X/GF; 4 to 6 axes, see RE 29883 RC control devices, see RE 95200		
On-board e	lectronics (O	BE)			Data from page 26		
					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		

 Mating plugs are not included in the scope of supply and must be ordered separately. IF Note!

The technical data were determined at a viscosity of  $\nu=30~\text{mm}^2\text{/s}$  (HLP46: 50°C).

= units stocked in Australia

# Ordering code



¹⁾ Max. 9 elements per side

- ²⁾ Only with S- and T-pressure compensator
- 3) "Z" impossible 4) "M" impossible

scope of supply and must be ordered separately.

# Ordering code



#### Hand lever position



## **Spools - standard types**

#### Symmetric spools

Spool type	Pressure compensator	Flow in L/min					
		150-150	120-120	080-080	050-050	032-032	
	S	130-130	100-100	070-070	045-045	028-028	
E, J, Q		110-110	085-085	060-060	040-040	025-025	
	С	175-175	145-145	110-110	080-080	045-045	
	Т	190-190	160-160	100-100	065-065	040-040	

#### Asymmetric spools

Spool type	Pressure compensator	Flow in L/min					
1 71		150-120	120-080	080-050	050-032		
	S	130-100	100-070	070-045	045-028		
E, J, Q		110-085	085-060	060-040	040-025		
	С	175-146	145-110	110-080	080-045		
	Т	190-160	160-100	100-065	065-040		

Complete control blocks are defined in accordance with the type code.

The order text can be used to specify technical features and requirements.

The Bosch Rexroth sales organisation derives a short code and a material number from the order text.

¹⁾ The hand lever version contains FKM and NBR seals

Example of a short code for an M4-15 control block with three directional valve elements:



1.3

# Modular design: Control block with lateral inlet element

Control blocks of series M4-15 are designed according to the modular principle. They can be optimally combined to suit the application at hand.



9

# Order example of Closed Center

#### Example

- Flow-controlled pump q_v max. 200 L/min
- Three actuators
- Hydraulic operation

#### **Resulting control block**

#### Number of directional valves, inlet element

• Closed Center, lateral, with primary valve, set to 250 bar

#### **Directional valve elements**

1st spool axis

- With pressure compensator, without load-holding function
- With 1 LS pressure relief valve, 200 bar
- Spool symbol J, flow in A and B 190 L/min
- Type of operation: hydraulic
- Secondary valves: Pressure relief/anti-cavitation valves, actuator ports A and B 320 bar

· With pressure compensator, with load-

#### 2nd and

3rd spool axis

- Holding function
  With LS pressure relief valves, actuator port A 180 bar,
- actuator port B 120 bar • Spool symbol E, flow in A and B 85 L/min
- Type of operation: hydraulic
- Secondary valves: Pressure relief/anti-cavitation valves, actuator ports A and B 320 bar

End element

LS unloading





1st s	spool axis						
Т	200M =	J	190-190	Н	_	H320	H320

2nd	spool axis						
S	180M120	Е	085-085	Н	_	H320	H320

3rd spool axis

S	180M120	Ε	085-085	Н	-	H320	H320





# Modular design: Control block with central inlet element

Control blocks of series M4-15 are designed according to the modular principle. They can be optimally combined to suit the application at hand. **Sequence of ordering code:** 



# Order example of central inlet with priority valve

<b>Example:</b> — Elow-controlled nump a may 200 L/min	
- One actuator with priority	
- One subordinate actuator	
Resulting control block	Ordering code:
Number of directional valves, end element	$2 M_{-15-2X} / 111$
Diversion plate	
Directional valve elements	
<b>1st spool axis</b> • Without pressure compensator, with load-holding (priority actua-	1st spool axis
tor) • Without LS pressure relief valve, without measuring ports	
flow in A and B 175 L/min	
<ul> <li>Type of operation: Electrohydraulic proportional, 24 V</li> <li>Operation with hand lever (upwards)</li> </ul>	
<ul> <li>Secondary valve bores plugged</li> </ul>	
<b>Inlet element:</b> • Central inlet element with priority valve (dynamic), (sandwich plate) primary pressure relief valve set to 300 bar	VZ 300 B 250
<ul> <li>LS pressure relief valve (priority actuator) set to 250 bar</li> </ul>	
<ul> <li>2nd spool axis • With pressure compensator, with load-holding function</li> <li>With LS pressure relief values.</li> </ul>	2nd spool axis           S         270 L 300         E         090-090         AAQ         K         Q         Q
actuator port A 270 bar; actuator port B 300 bar	
<ul> <li>With electroprop. pressure limitation, 210 bar (falling characteristic curve)</li> </ul>	
• Spool symbol E,	
Type of operation: digital OBE	
analogue interface	
<ul> <li>Operation with hand lever (upwards)</li> </ul>	
<ul> <li>Secondary valve bores plugged</li> </ul>	
End element • With pilot oil supply	
L * · · · · · · · · · · · · · · · · · ·	$M_{B}^{*} M_{A} T1^{*} LSz^{*}Y X^{*}$

Characteristic curves (measured at  $v = 30 \text{ mm}^2/\text{s}$  and  $\vartheta = 50^{\circ}\text{C}$ )





#### Inlet element central

**Closed Center with primary valve** (sandwich plate)

Ordering code: JZ ...

#### Short description

- · For flow-controlled pump up to 300 L/min
- · Pressure data required for primary valve after JZ ... (3 digits)
- · Technical data of primary valve to RE 64642, characteristic curve D5

#### Inlet element central

Closed Center, without primary valve Ordering code: JZQ

With priority valve, without primary valve

· For flow-controlled pump up to

#### Short description

Inlet element central

Ordering code: VZQ Short description

200 L/min

· For flow-controlled pumps up to 300 L/min





P X Y LS1

LS



### Inlet element central

With priority valve, with primary valve

with priority valve required (3 digits)

#### Ordering code: VZ ...

#### Short description

- · For flow-controlled pump up to 200 L/min
- Pressure data required for primary valve after VZ ... (3 digits)
- Pressure details for LS-pressure limitation with priority valve required (3 digits)

1; 2) See page 13



# M4-15 | RE 64283/06.05

P

- $^{1)}$  In the case of priority actuators with fixed flow we recommend version "V ... A".
- $^{2)}$  In the case of dynamic priority actuators (e.g. steering) we recommend version "V  $\ldots$  B".





# Spools

Spool variants							
Ordering code Flow given in L/min	Main application	Spool symbol					
Ε	Hydraulic cylinders as actuators	A M _B M _A B					
J –	Hydraulic motors as actuators	A M _B M _A B					
Q –	Application with defined residual open- ing (A/B $\rightarrow$ T) Actuator port unlaoded in neutral posi- tion!						

#### Spool characteristic curves



¹⁾ Curve form depends on the calibrated characteristic curve and setting of the EPM (standard: linear).

²⁾ Command value depends on interface and CAN protocol

### Directional valve elements: pressure compensator

#### Flow control by individual pressure compensator



In the central position of the main spool, there is no connection from P to actuator ports A and B. In this operational state, the pump pressure shifts pressure compensator spool (1) to the left against spring (2).

When main spool (3) (= metering orifice) is operated, the LS pressure gets into spring chamber (4) and pushes the pressure compensator spool to the right to the control position. The flow is kept constant, even with parallel operation of actuators with different load pressures.

Pressure compensator "S" features a load-holding function. This load-holding function is not leak-free.

The number of sections (5) used depends on the required flow.

Central position of main spool





#### Standard spool types

#### Symmetric spools

· ·							1	
Spool type	Pressure compensator		Flow in L/min					
		150-150	120-120	080-080	050-050	032-032		
	S	130-130	100-100	070-070	045-045	028-028		
E, J, Q		110-110	085-085	060-060	040-040	025-025		
	С	175-175	145-145	110-110	080-080	045-045		
	Т	190-190	160-160	100-100	065-065	040-040		
Asymmetric spools								
Spool symbol	Pressure compensator			Flow in L/min				
		150-120	120-080	080-050	050-032			
	S	130-100	100-070	070-045	045-028			
E, J, Q		110-085	085-060	060-040	040-025			
, ,	С	175-145	145-110	110-080	080-045			
	Т	190-160	160-100	100-065	065-040			

Flow without sections (pressure compensator  $\Delta p = 6$  to 9 bar) -

Flow with 1 section (pressure compensator  $\Delta p = 7.5$  to 10 bar) -

Flow with 2 sections (pressure compensator  $\Delta p = 9$  to 12 bar)

#### Example:

Command value:  $q_{v' \text{ actuator}} = 140 \text{ L/min} \rightarrow 130 \text{ L} - \text{spool} + 2 \text{ sections} = 150 \text{ L/min}$  $\rightarrow \text{ set } 140 \text{ litres by means of the ,stroke limiter.}$ 

.

# Directional valve elements: Pressure compensator

## Ordering code S Short description

- Short description
- With pressure compensator
- With load-holding function ¹⁾
- Max. flow 150 L/min



## Ordering code T Short description

- With pressure compensator
- Without load-holding function
- Max. flow 190 L/min

# Ordering code C Short description

- Without pressure compensator
- With load-holding function ¹⁾
- Max. flow 200 L/min



¹⁾ The load-holding function is not leak-free.

# Directional valve elements: LS pressure limitation

## Characteristic curves

Reduction of the actuator	flow through
LS pressure limitation	
Minimum set value:	50 bar

Maximum set value:

330 bar

В

Α



# With LS pressure relief valve Ordering code ... M ...

#### Short description

- · Pressure details for actuator ports "A" and "B" (3 digits), e.g. 180M120
- With version "QMQ" the LS pressure limitation can be retrofitted on the directional valve element.
- External influence on the LS pressure possible via ports  $M_A$  and  $M_B$ . These ports can also be used as measuring ports.

# With only 1 LS pressure relief valve Ordering code ... M = Short description

- · Only 1 LS pressure relief valve for the same pressure setting in A and B
- 1 measuring port



N

# Directional valve elements: LS pressure limitation



• Housing without measuring ports



# Pressure control through electro-proportional LS pressure limitation (falling characteristic curve)

With electro-proportional pressure relief valve

210 bar, falling char. curve

210 bar, rising char. curve

350 bar, falling char. curve

350 bar, rising char. curve

Ordering code: Short description





type KBPS¹⁾

L

J

R

Ν

rising char. curve

# Directional valve elements: Secondary valves







Anti-cavitation valve Ordering code: EE

Ordering code: QH ... Short description

valve, pilot operated

200 bar for actuator port B

ting secondary valves

Example: QH200

# Directional valve elements: Types of operation



Mating plugs are not included in the scope of supply and must be ordered separately!

# Directional valve elements: Types of operation

Electrohydraulic proportional with hand lever					
Ordering					
code	Short description				
W21	Junior Timer (AMP) 24 V				
W28	DT04-2P (Deutsch) 24 V				
W23	Junior Timer (AMP) 12 V				
W29	DT04-2P (Deutsch) 12 V				
K ,L, M,	with additional mechanical actuation				

Proportional pressure reducing valve type FTDRE 2 K to RE 58032

#### Safety note

The mechanical operating element can override the electrohydraulic one. The hand lever is connected directly to the main spool and follows the spool movement in the case of electrohydraulic control.



# Electronic pilot module

Ordering

- code Short description
- AAQ Digital OBE analogue interface
- CAQ Digital OBE-CAN-BR protocol
- CBQ Digital OBE -CANopen protocol



# **End elements**



# Unit dimensions: Control block with lateral inlet element (in mm)



# Unit dimensions: Control block with central inlet element (in mm)



7 Primary pressure relief valve

8 x M10; 15 deep

P, T	= G1
A1 - A3; B1 - B3	= G3/4
LS; LSz; M; Y	= G1/4
T1	= G3/4
Х	= G1/4

# Unit dimensions: Control block with central inlet element and priority valve (in mm)



- 3.2 End element, diversion plate
- 4.1 Control cover (side A) for electrohydraulic operation "W.."
- module (EPM)
- 5 Control cover (side B) with hand lever for mechanical operation "K"
- 6 Stroke limiter

P, T	=G1
A1 - A3; B1 - B3	= G3/4
LS; LSz; M; Y	= G1/4
T1	= G3/4
Х	= G1/4

# On-board electronics: Electronic pilot module (EPM)

#### Function

The electronic pilot module controls the flow across control block M4-15 on the basis of an analogue or digital electronic signal.

The pilot module converts an analogue (voltage or PWM signal) or a digital (CAN bus) input signal by means of two electrohydraulic pressure reducing valves into a pilot pressure.

In the case of an analogue input signal, each pilot module is individually connected to the control electronics of the machine.

In the case of CAN bus control, it is possible to loop the electrical connection through to the next pilot module via the second plug-in connection (daisy chain wiring). The entire valve control block is then connected to the control of the machine by means of the 4-pin plug-in connector.

The electrical connection is made by means of a 4-pin plug-in connector of type Bosch Kompakt 1.

Further CAN bus devices can be connected to the output of the last pilot module.

#### Features

Time functions (ramp functions), the characteristic curve shape and gradient can be parameterised or changed directly via the CAN bus during the working cycle.

Various diagnosis functions monitor the pilot module for proper operation.

In the standard version, the following is monitored:

- · Correct receipt of a valid command value signal
- Proper connection to the command value encoder
- · Compliance with defined limits of the supply voltage
- Function of pilot valves (short-circuit, cable break)

Malfunction is signalled by an externally visible LED in the form of a fault code (flashing code).

With the analogue module, a relay output is provided as fault indicator.

With the CAN bus variant, a fault code is transferred in the state telegram of the pilot module to the control, where the fault can be evaluated.

- Low cabling effort with CAN wiring in the form of daisy chaining
- Maximum number of chained modules
- 8 modules in the case of 12 V, 12 modules in the case of 24 V ( $\Sigma~I \leq$  10 A)
- · Clocked output stages with superimposed dither
- Processor-independent watchdog
- Time ramps can be separately selected for valve output A and B, opening and closing (for CAN only; for analogue module, firmly parameterised)
- Characteristic curve can be separately changed for A and B from linear to progressive profile (CAN only; for analogue module, firmly parameterised)
- Linear lowering of the characteristic curve and therefore linear reduction of the total flow is possible during operation (CAN only; for analogue module, firmly parameterised)



M4-15 with on-board electronics and CAN control

- Selectable time ramps for shutdown in the event of a fault (with analogue module only)
- · Selectable monitoring limits for the operating voltage
- Can be parameterised via CAN bus or RS232 interface (with interface box and software tool, see Accessories on page 29)
- Type of protection to EN 60529 IP67, IP69K; (only with plugged Bosch Kompakt plug-in connectors)
- Internal counting of operating hours
- · Internal saving of diagnosis data
- Comprehensive custom parameterisation possible at Bosch Rexroth

# Electronic pilot module



#### Pin assignment

Connection by means of Bosch Kompakt plug-in connector, coding 1.

In the case of CAN control, the second Bosch Kompakt plugin connector with coding 2 can be used for the connection to the next module or another CAN station.

#### Note:

Connecting cables or plug-in connectors are not included in the scope of supply and must be ordered separately (see Accessories).



Pin assignment of Bosch Kompakt plug-in connector

#### Safety notes

is rotated through 180°!

In the case of chained modules or other CAN bus stations, the maximum current of Imax = 10 A must not be exceeded. The maximum number of modules is 8 for an operating voltage of 12 V, and 12 modules for an operating voltage of 24 V.

For fusing on the machine side, 10 Ampere must be provided. The orientation of plug-in connectors of coding 1 and coding 2

An external terminating resistor must be provided on the CAN bus. A connecting cable with integrated terminating resistor is available as accessory item (see page 29). It is to be used in the connection to the last pilot module of the valve block.

In the case of a voltage signal, the potentiometer supply must be picked up directly from the valve. The higher the cable resistance between the supply pick-up and the valve plug-in connector, the more is the command value falsified. This can lead to low-frequency vibrations of the valve.

The electronic pilot module must not be opened!

If a repair is necessary, the material and serial numbers must be provided for the technical identification.

## ▲ Caution!

Observe the engineering and safety notes in the operating instructions RE 64565!

# **Technical data**

General						
Supply voltage	12 V and/or 24 V vehicle network					
	Permissible voltage range 9 to 32 V					
El. power consumption	$U_{\rm Bat} = 14 \text{ V}$		$U_{\rm Bat} = 28 \text{ V}$			
	typ.[W]	max.[W]	typ. [W]	max.[W]		
in neutral position	0.5	0.6	1.0	1.2		
at maximum input	13	15	13	15		
Resolution	< 2% (deviations possible depending on the spool stroke and spool char. curve)					
Input signal						
The following input signals are possible:						
Voltage						
Signal voltage	Absolute (0.5 to 9.5 V) neutral = 5.0 V					
	relative to $U_{\text{Bat}}$ (0 V + 5% $U_{\text{Bat}}$ -5%) neutral = $U_{\text{Bat}}$ / 2					
Pin assignment according to lettering on the	Coding 1	(black)	Coding 2 (	Coding 2 (grey)		
plug-in connectors	Pin 1 = 0	Ground	not possible	not possible		
	$Pin \ 2 = S$	Signal				
	Pin 3 = F	Pin 3 = Relay output				
	$Pin \ 4 = l$	$Pin 4 = U_{Pat}$				
Input resistance	> 100 kΩ		•			
Command value potentiometer	Recommended: $\leq$ 5 k $\Omega$					
Driver for safety relays	100 mA					
<b>PWM</b> (pulse-width-modulated)						
Signal voltage	10 V absolute					
5 5	Battery voltage	Battery voltage (standard)				
Pin assignment according to lettering on the	Coding 1 (black)		Coding 2 (	Coding 2 (grey)		
plug-in connectors	Pin 1 = Ground		not possible	Э		
	Pin 2 = Signal					
	Pin 3 = F	Relay output				
	Pin 4 = l	$Pin 4 = U_{Bot}$				
Input resistance	> 100 kΩ					
Signal types	Normal / inverte	Normal / inverted				
Frequencies	8 to 200 Hz					
	122 to 132 Hz (127±5 Hz) (standard)					
Driver for safety relays	100 mA					
CAN bus						
Pin assignment according to lettering on the	Coding 1	Coding 1 (black) Coding		grey)		
plug-in connectors	Pin $1 = 0$	Pin 1 = Ground Pin 1 = $U_{B_2}$		ıt		
	$Pin \ 2 = 0$	CAN-high	I-high Pin 2 = CAN-low			
	Pin 3 = 0	CAN-low	Pin 3 = CA	N-high		
	Pin 4 = $U_{\text{Bat}}$ Pin 4 = Ground		ound			
Input signal	Physical layer according to ISO 11898 'High Speed'					
Physical layer	According to ISO 11898 CAN 2.0A and 2.0B					
Baud rate	125 to 500 kBaud					
Scanning	Single scanning					
Bus termination (120 $\Omega$ resistor)	By the customer through external wiring or connecting cable with					
	Integrated resistor					
Protocols	CANopen to DSP 408, Rexroth protocol					

## Accessories

#### Plug-in connector set Bosch Kompakt coding 1 Material number: R900785606 (item 1)

- Bosch Kompakt plug-in connector, coding 1
- 4 contacts AMP JPT 1.5 to 2.5  $\mbox{mm}^2$
- 4 contacts AMP JPT 0.5 to 1.0 mm²
- 4 strand seals, 1.5 to 2.5 mm²
- 4 strand seals, 0.35 to 1.0 mm²
- 4 blind plugs
- 1 sleeve

#### Plug-in connector set Bosch Kompakt coding 2 Material number: R900785607 (item 2)

- Bosch Kompakt plug-in connector, coding 2
- 4 contacts AMP JPT 1.5 to 2.5 mm²
- 4 contacts AMP JPT 0.5 to 1.0 mm²
- 4 strand seals, 1.5 to 2.5 mm²
- 4 strand seals, 0.35 to 1.0 mm²
- 4 blind plugs
- 1 sleeve

Plug-in connector Bosch Kompakt, coding 2 with integrated terminating resistor Material number: R917002587

Plug-in connector Bosch Kompakt, coding 2 Blind plug

Material number: R917002586

Connecting cable, 4-pin, length approx. 90 mm Material number: R900785196 (item 3)

For the connection of 2 pilot modules

Connecting cable, 4-pin, length approx. 250 mmMaterial number:R917002224For the connection of 2 pilot modules

Connecting cable, 4-pin, length approx. 4000 mm Material number: R917002506

For the connection of the machine electronics to the OBE with a plug-in connector Bosch Kompakt, coding 1

#### ▲ Caution!

The class of protection is not defined, since a plug-in connector is provided only on one side.

#### Customer parameterisation tool

Customer tool for editing customer-specific parameters.

Connection to the valve via the serial interface of a commercial PC in conjunction with the configuration box that is available as accessory item.

#### Interface box (in preparation)

For converting the valve-sided signal level to the values of the RS232 required by the PC and, at the same time, for connecting the valve to a voltage source.

Cable sockets for FTDRE ... and FTWE ... Type of protection IP69 K

Material number: R901022127







EHS tool



Cable socket

#### Electronic pilot module - parameter specifications

The form for parameter specifications can be found in data sheet RE 64565-07b. It forms the basis for parameterising the electronic pilot module according to the customer's wishes in the factory.

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## Notes

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