RE 64 555/05.03

Replaces: 02.02

Hydraulic pilot control units for armrest installation

Type 4TH6, 4TH6N, 4TH5, series 1X

Types 4TH6, 4TH6N

Type 4TH5 for mini excavators

Overview of contents

Functional description, section	2
Technical data	3
Ordering details	4
Variations of ergonomic grip EC2000	5
Characteristic curves	6 - 7
Unit dimensions	8
Contact location within the plugs for wiring grip EC2000	9
Guidelines	10

Features

- Progressive, sensitive operation
- Low actuation forces
- Low force deviations when lever is actuated (4TH5, 4TH6N)
- Several ergonomic grips with various E contacts
- All connections point downwards

Functional description, section

Design

The 4TH6, 4TH6N and 4TH5 pilot control units basically comprise of a control lever (5), four pressure adjustment valves and a housing (10).

Each pressure adjustment valve comprises of a control spool (6), a control spring (7), a return spring (8) and a plunger (9).

General

The design of the 4TH6N and 4TH5 versions differs from that of the 4TH6. Thereby the force's deviations, which are felt when the lever is deflected, are reduced.

As the 4TH5 is smaller and lighter, it is normally used for applications in compact machines.

Function

When not actuated the control lever is held in zero position by the four return springs (8). The control ports (1, 2, 3, 4) are connected to the tank port **T** via the drilling (11).

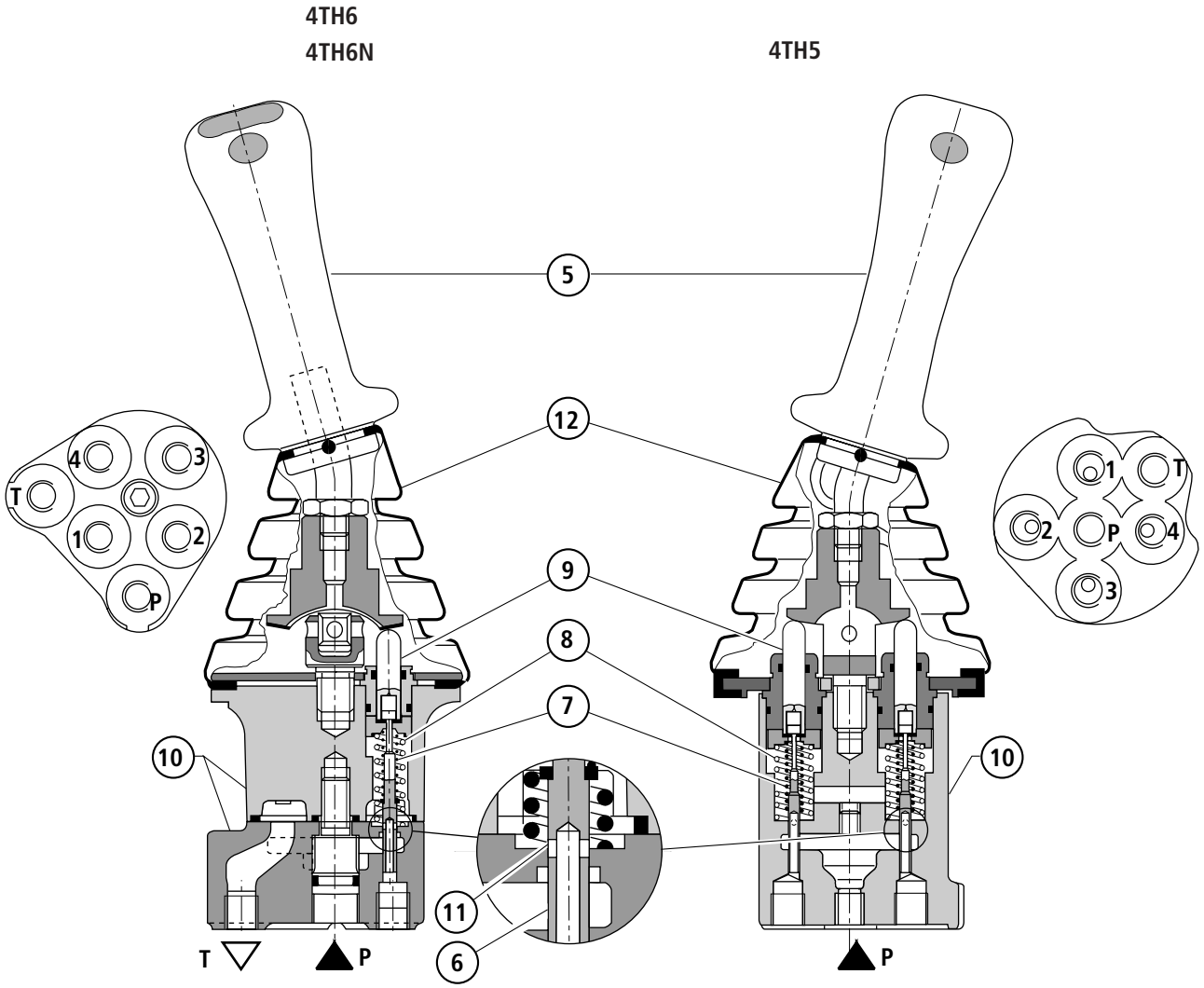
With deflection of the control lever (5) the plunger (9) pushes against the return spring (8) and the control spring (7). The control spring (7) firstly moves the control spool (6) downwards and closes the connection between the appropriate port and tank port **T**. At the same time the appropriate port is connected to the port **P** via the drilling (11). The control phase begins as soon as the control spool (6) has found its balance between the force of the control spring (7) and the force which results from the hydraulic pressure in the appropriate port (ports 1, 2, 3 or 4).

Through the interaction of control spool (6) and control spring (7) the pressure in the appropriate ports is proportional to the stroke of the plunger (9) and thus the position of the control lever (5).

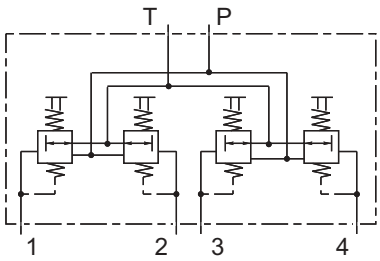
A rubber grommet (12) protects the mechanical components of the housing from contamination.

Ports

P	Supply
T	Tank
1, 2, 3, 4	Control ports



Symbol, hydraulic

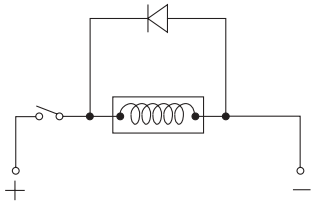


Technical data, mechanical (for applications outside these parameters, please consult us!)

		4TH6, 4TH6N	4TH5
Inlet pressure	bar	up to 50	up to 35
Back pressure at port T	bar	up to 3	
Pilot oil flow (P to 1 – 2 – 3 – 4)	L/min	up to 16	up to 13
Pressure fluid [1] suitable for NBR seals		mineral oil (HL, HLP) to DIN 51524 [1]	
[2] suitable for FPM seals		phosphate ester (HFD-R) [2]	
Pressure fluid temperature range	°C	– 20 to + 80	
Viscosity range	mm^2/s	10 to 380	
Degree of contamination		maximum permissible degree of contamination the pressure fluid is to NAS 1638 class 9. We, therefore recommend a filter with a minimum retention rate of $\beta_{10} \oplus 75$	
Max. permissible actuation moment at the lever	Nm Nm	10 during operation 80 with an exceptional, one time loading	
Weight	kg	2.6	1.9

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

Technical data for the grip switch EC2000			
• Switching capacity			
–minimal current	resistive load	100mA at 12VDC or 24VDC	
–maximal current	resistive load	5A at 12VDC or 24VDC	
• Microswitch lifetime			
–resistive load at 12VDC		100 to 500mA 5A	5 millions cycles 300000 cycles
–resistive load at 24VDC		100 to 500mA 5A	3 millions cycles 150000 cycles
–inductive load L/R=5ms at 12VDC or 24VDC		1,25A	200000 cycles
• Maximal contact resistance	mW	20	
• Switching on/off with low loads			
– minimum voltage	V	12	
– minimum current strength	mA	100	
• E-contact type		high current	
Grip protection		IP65	
Switching guidelines for DC voltages		to ensure the service life of the electrical switch, we recommend the use of free-wheeling diodes that are switched parallel to the inductivity.	



Ordering details

4 TH 5 / 4 TH 6		– 1X/					*

Operating force deviations
For 4 TH 5:
– Reduced **= No code**
For 4 TH 6:
– Conventional **= No code**
– Reduced **= N**

Ergonomic grip range
EC2000 **= E**
EC4000 **= H**

Control curve (see pages 6 and 7)	**4TH6**	**4TH6N**	**4TH5**	
	•	•		**06**
	•			**20**
	•	•	•	**70**
	•	•		**97**
	•		•	**106**
Different control curve: state identification No.	•			

Series 10 to 19 (10 to 19: unchanged installation and connection dimensions) **= 1X**

Type of ergonomic grip (see page 5)
EC2000 without E-contact **= TT**
EC2000 with E-contact (select the required version from page 5) **= ST, VT, YT, YU**
EC4000 see datasheet : RE 64562

Grip orientation (see page 8)	**4TH6**	**4TH6N**	**4TH5**	
Lever straight, grip in the direction of control port 3	•	•		**03**
Lever curved 15° in the direction of control port 4. Grip in the direction of control port 3	•	•	•	**43**
Lever curved 15° in the direction of control port 2. Grip in the direction of control port 3	•	•	•	**23**

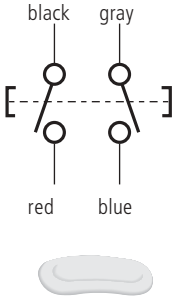
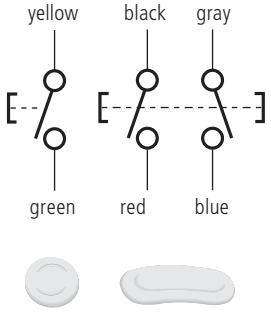
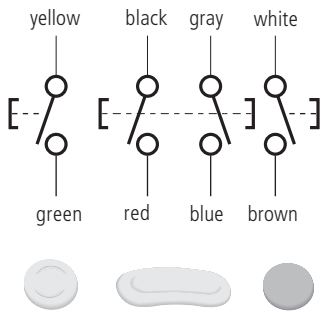
Plug (see page9)		**4TH6**	**4TH6N**	**4TH5**	
DEUTSCH sealed plug IP 67 for wiring the grip		•	•	•	**5**
Plug AMP MAT-N-LOK for wiring the grip		•	•		**6**
Without plug	**no code**	•	•	•	

Seals		**4TH6**	**4TH6N**	**4TH5**	
NBR seals	⚠ Attention! The compatibility of the seals and	•	•	•	**M**
FPM seals	pressure fluid has to be taken into account	•	•		**V**

Connection threads		**4TH6**	**4TH6N**	**4TH5**	
Pipe thread to ISO 228/1	G 1/4	•	•	•	**01**
Metric connections to ISO 9974	M 14 X 1.5	•			**02**
Connections to JIS 2351		•		•	**04**
UNF connections to ISO 11926	9/16 UNF-2B	•	•	•	**05**

Further details in clear text

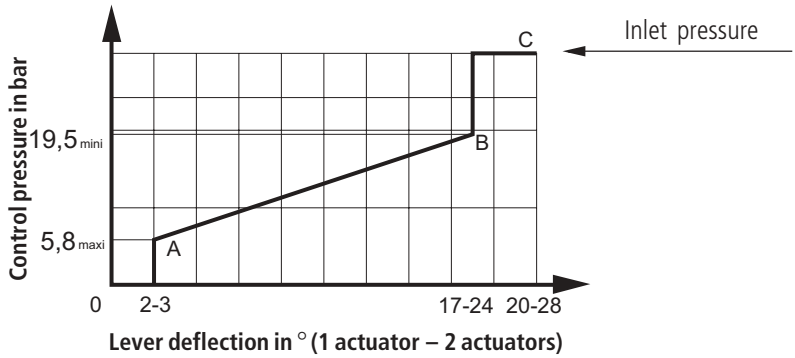
Variations of ergonomic grip EC2000

TT 	– without E-contact	
ST 	– single E-contact on top	
VT 	– double E-contact with rocker swith	
YT 	– double E-contact with rocker switch – single E contact on top	
YU 	– double E-contact with rocker switch – single E-contact on top – single E-contact to the front	

Characteristic curves: control ranges, actuation moments

06 **Control curve, identification No. 06**

This curve is used for the pilot control of the SM12, SM18, M1 control blocks

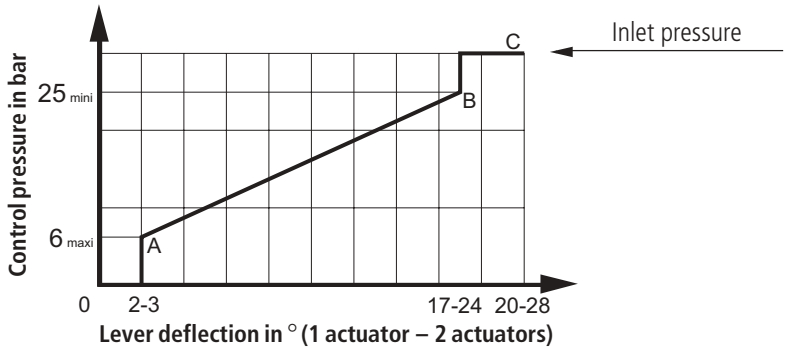


		4TH6		4TH6N	
No. of actuated actuators		1	2	1	2
Actuation	A	0.8	1.2	0.8	1.2
moment	B	2.7	4.6	1.8	2.55
in Nm	C	3.8*	6.4*	2.7	4

* $p = 35$ bar

70 **Control curve, identification No. 70**

This curve is used for the pilot control of the SX12, SX14, SX18 control blocks

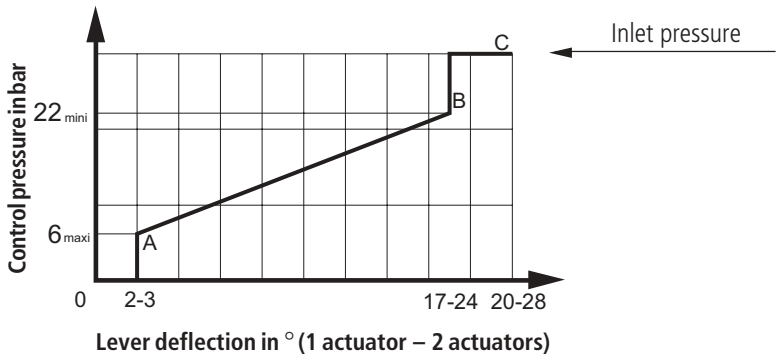


		4TH6		4TH6N		4TH5	
No. of actuated actuators		1	2	1	2	1	2
Actuation	A	0.8	1.2	0.8	1.2	0.9	1.35
moment	B	3.1	5.3	2	3	2	3.4
in Nm	C	3.8*	6.4*	2.7	4	2.5	4.3

* $p = 35$ bar

106 **Control curve, identification No. 106**

This curve is used for the pilot control of the SM12 control blocks (application example: mini excavator)



		4TH6		4TH5	
No. of actuated actuators		1	2	1	2
Actuation	A	0.8	1.2	0.9	1.4
moment	B	2.9	4.9	1.7	2.9
in Nm	C	3.8*	6.4*	2.5	4.3

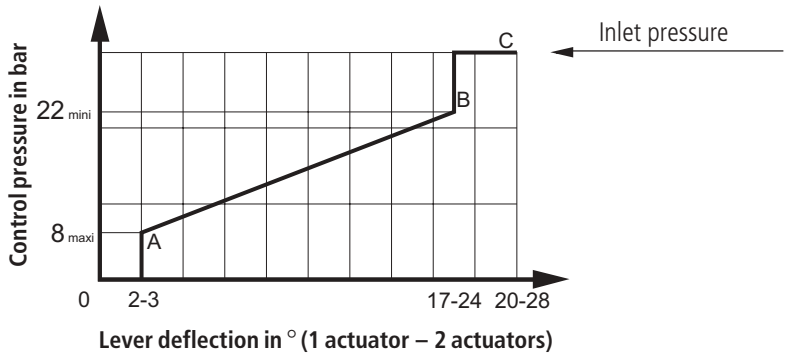
* $p = 35$ bar

The actuation moments stated take into account the hydraulic forces acting on the spool area, the return spring force (standard version) and the rubber grommet resistance.

Characteristic curves: control ranges, actuation moments

20 **Control curve, identification No. 20**

This curve is used for the pilot control of the SP12 control blocks

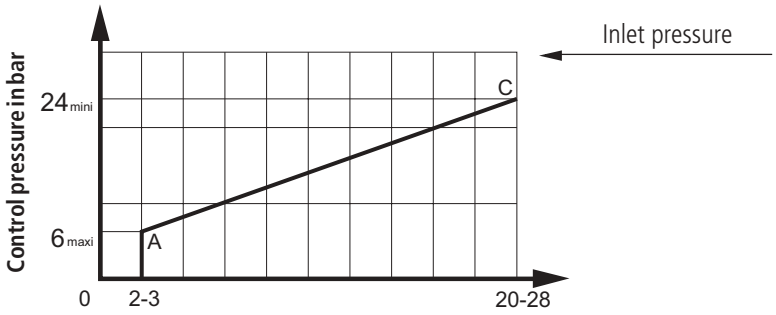


		4TH6	
No. of actuated actuators		1	2
Actuation	A	1	1.4
moment	B	2.9	4.9
in Nm	C	3.8*	6.4*

* p = 35 bar

97 **Control curve, identification No. 97**

This curve is used for the pilot control of the M6, M7, M4 control blocks



		4TH6		4TH6N	
No. of actuated actuators		1	2	1	2
Actuation	A	0.8	1.2	1.1	1.5
moment	B				
in Nm	C	3.8*	6.4*	2.6	3.7

* p = 35 bar

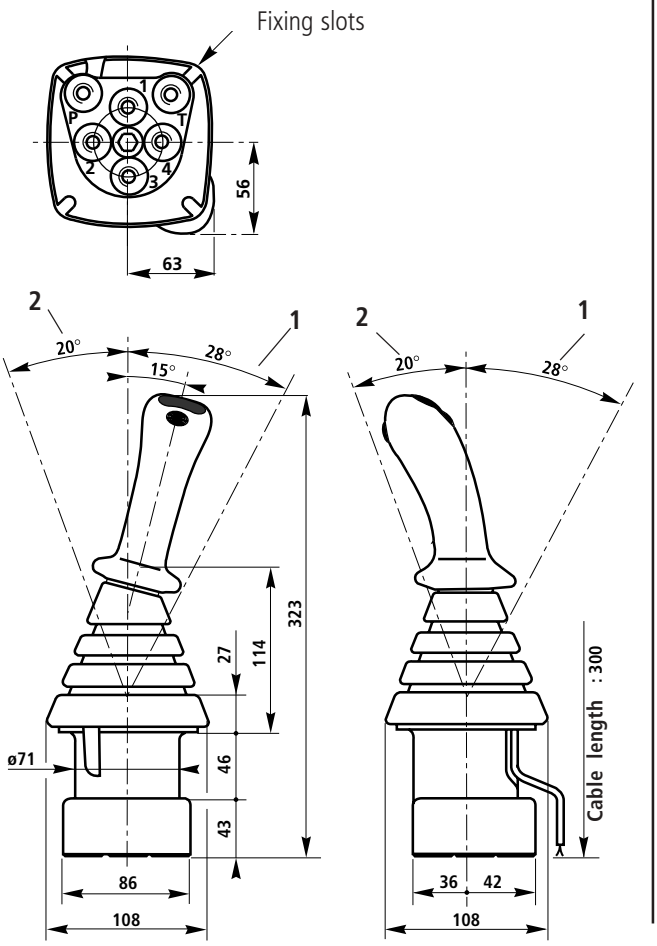
The actuation moments stated take into account the hydraulic forces acting on the spool area, the return spring force (standard version) and the rubber grommet resistance.

Unit dimensions (Dimensions in mm)

Type designation of the pilot control units shown:

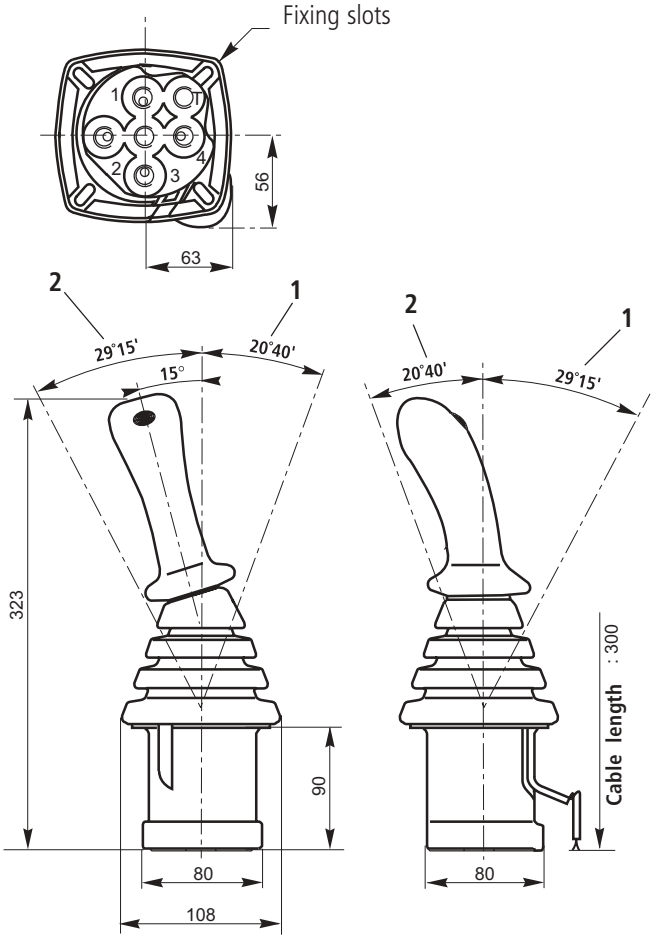
4 TH 6 E XX - 1X / - - 43 - - -

4 TH 6 N E XX - 1X / - - 43 - - -



Type designation of the pilot control unit shown:

4 TH 5 E XX - 1X / - - 23 - - -



1 Lever deflection when simultaneously actuating 2 actuators.

2 Lever deflection when actuating 1 actuator.

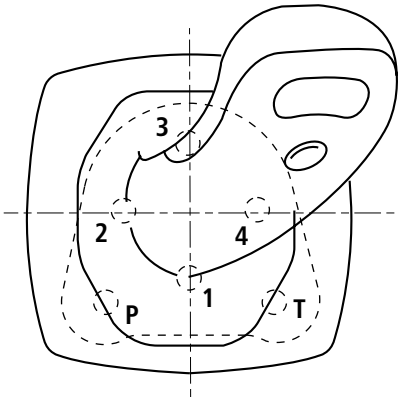
Orientation of the pilot control units at the driver's seat (viewed from above)

Pilot control unit left hand

4 TH 5 E XX - 1X / - - 43 - - -

4 TH 6 E XX - 1X / - - 43 - - -

4 TH 6 N E XX - 1X / - - 43 - - -

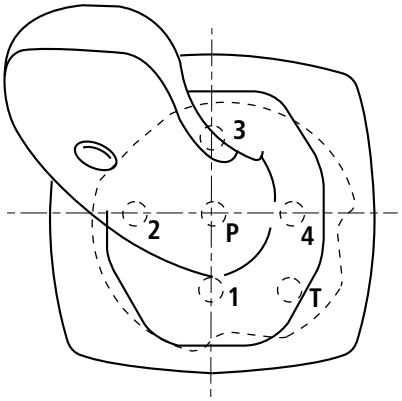


Pilot control unit right hand

4 TH 5 E XX - 1X / - - 23 - - -

4 TH 6 E XX - 1X / - - 23 - - -

4 TH 6 N E XX - 1X / - - 23 - - -

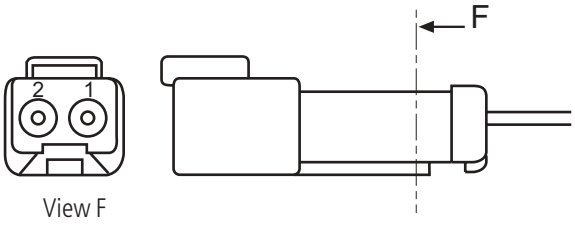


Contact location within the plugs for wiring grip EC2000

DEUTSCH sealed plug IP 67
(ordering detail = 5)

Plug AMP MAT-N-LOCK
(ordering detail = 6)

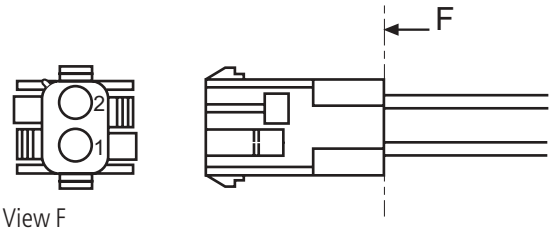
Grip ST



View F

cover DEUTSCH DT 04 - 2P - CE 04

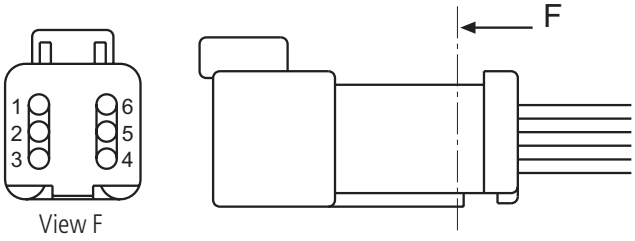
Grip ST



View F

cover AMP 350778 - 1

Grip VT or YT

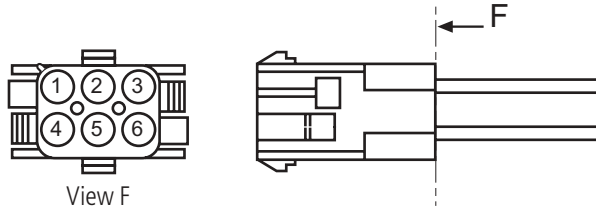


View F

cover DEUTSCH DT 04 - 6P - CE 04

Identification in the plug	wire colour	Ergonomic grip type	
		VT	YT
1	red	x	x
2	black	x	x
3	gray	x	x
4	blue	x	x
5	yellow		x
6	green		x

Grip VT or YT

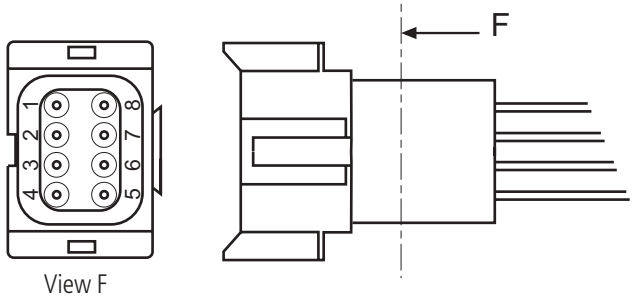


View F

cover AMP 350781 - 1

Identification in the plug	wire colour	Ergonomic grip type	
		VT	YT
1	red	x	x
2	black	x	x
3	gray	x	x
4	blue	x	x
5	yellow		x
6	green		x

Grip YU

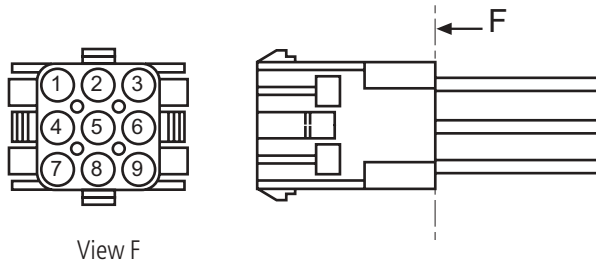


View F

cover DEUTSCH DT 04 - 8P - CE 04

Identification in the plug	wire colour	identification in the plug	wire colour
1	red	5	yellow
2	black	6	green
3	gray	7	white
4	blue	8	brown

Grip YU



View F

cover AMP 350782 - 1

Identification in the plug	wire colour	identification in the plug	wire colour
1	red	5	yellow
2	black	6	green
3	gray	7	white
4	blue	8	brown

Application guidelines (these guidelines are not intended to be considered as complete)

- Do not direct the jet of a pressure washing unit directly at the unit.
- The electrical cable must be kept free of any mechanical forces.
- During operation protection via the rubber grommet must be ensured.
- Only use the unit with its original grip and lever.
- Ensure that the inertia data of the original grip are not exceeded.
- Replace worn push buttons, so that the integrity of the gripEC2000 is ensured.

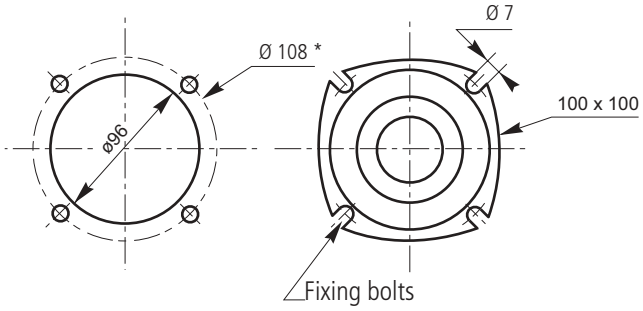
Safety guidelines (these guidelines are not intended to be considered as complete)

- Only one function control must be allocated to an E-contact.
- The circuit functions are to be so designed that uncontrolled machine movements caused by the application are prevented and that it is possible to switch from one function to another.
- Take into account all of the application limits, particularly those application limits stated within this catalogue sheet.
- Preparation for assembly and testing on the machine: The various checks must include all the functions of the pilot control device.

Installation guidelines: 4TH6, 4TH6N, 4TH5

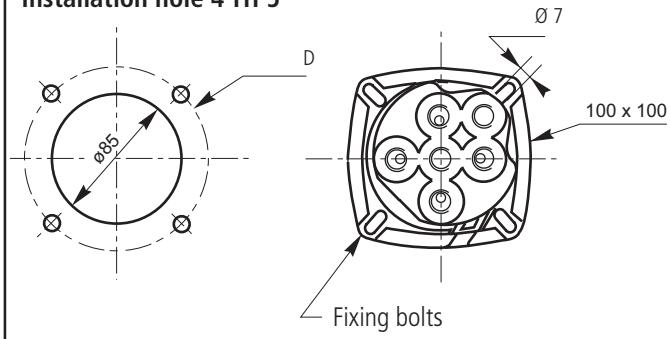
- Mounting flange area: Flatness = 0.5 mm
- Screw head imensions = Ø 10 mm
- Tightening torque for the flange fixing screws = Max. 10 Nm
- Tightening torque for the pipe connections = Max. 30 Nm

Installation hole 4 TH 6



* Ø 108 = Nominal diameter / fixing via 4 screws

Installation hole 4 TH 5



– Nominal diameter / fixing via 4 screws
D = 92 to 108 mm

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Notes

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