



**PNEUMAX**



# PRESSURE REGULATORS **WPR SERIES**

WIDE PRESSURE RANGE

**FLU-TECH CO. LTD.**

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LINE OA

WEBSITE



## Series WPR



- Output pressure up to 18 bar
- Flow rate up to 4000NI/min
- There are versions available with or without proportional integration
- Proportional Integrated versions available with Analogue/Digital, CANopen®, IO-Link, EtherCAT®, PROFINET IO RT and EtherNet/IP interface
- IN / OUT connections, main regulator G1/2"
- EXH connection, main regulator G1/4"
- IN connection, pilot regulator M5
- Versions available with external feedback



WPR proportional piloting pressure regulators are designed to be able to provide an output pressure value P2 up to 18 bar and are available with the integrated pilot proportional pressure regulator or with an M5 connection for pneumatic proportional remote piloting. The main regulator and pilot regulator maintain separate supplies, while the main regulator has a maximum inlet pressure of 20bar the proportional pilot regulator maintains the inlet pressure of 10 bar. The ratio of pilot pressure to outlet pressure is between 1:1 and 1:2 depending on the inlet pressure and pilot pressure. The device is made with G1/2 IN/OUT main connections and provides a nominal flow rate of 4.000 NI/min. The device is available with pneumatic, Analog/Digital, CANopen®, IO-Link, EtherCAT®, PROFINET IO RT and EtherNet/IP interfaces. Proportional management refers only to the low-pressure piloting part.

### Product presentation and applications

WPR proportional regulators (Wide Pressure Range) are ideal for all applications where there is a need to use a low-pressure (0-9 bar) reference signal resulting in a high-pressure (0-18 bar) P2 output. The devices have separate pneumatic supplies for the main regulator and the integrated pilot proportional regulator. The main regulator features G1/2" IN/OUT connections and a G1/4" EXH drain connection. The input connection of the integrated pilot proportional regulator is M5 ported. An external feedback version is available an option that allows the P2 pressure signal to be taken from a remote point rather than directly from the usage connection. This function is usually used when the end user is not near to the devices. At the top is located the management electronics or the connection for remote piloting. The fixing takes place through the use of a special fixing bracket.

### Technical characteristics

IN/OUT connections	G1/2"
EXH connections	G1/4"
Max. torque fitting tightening (Nm) IN/OUT/EXH connections	G1/2" Metallic: 30 G1/4" Metallic: 20
Fluid	20µm filtered and preferably non-lubricated air. For the proportional regulator pilot 5µm filtered non-lubricated and dehumidified air.
Pressure gauge	G1/8" pressure gauge socket
Mounting options	In line
Mounting positioning	Indifferent
Body and connections type	Aluminum body, integrated aluminum connections

### Operational characteristics

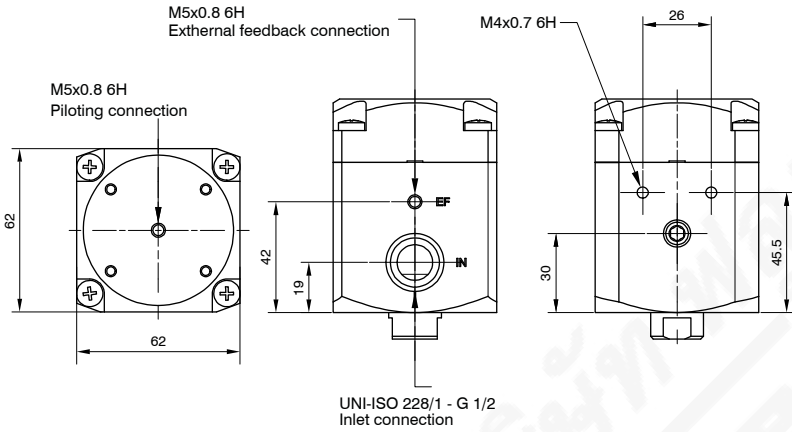
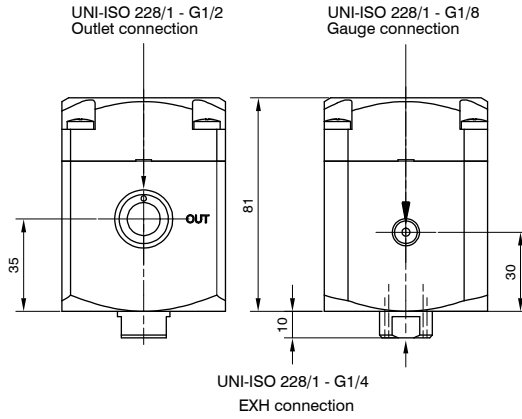
Main regulator max inlet pressure (bar)	20 (the inlet pressure must be at least 1bar higher than the desired outlet pressure)
Pilot regulator max inlet pressure (bar)	10 (the inlet pressure must be at least 1bar higher than the desired outlet pressure)
Piloting pressure range (bar)	0 ... 9
Temperature range (°C)	-5 ... +50

WPR pressure regulator

Coding: 173P12R<sup>①</sup>P<sup>②</sup>



173P12R<sup>①</sup>P

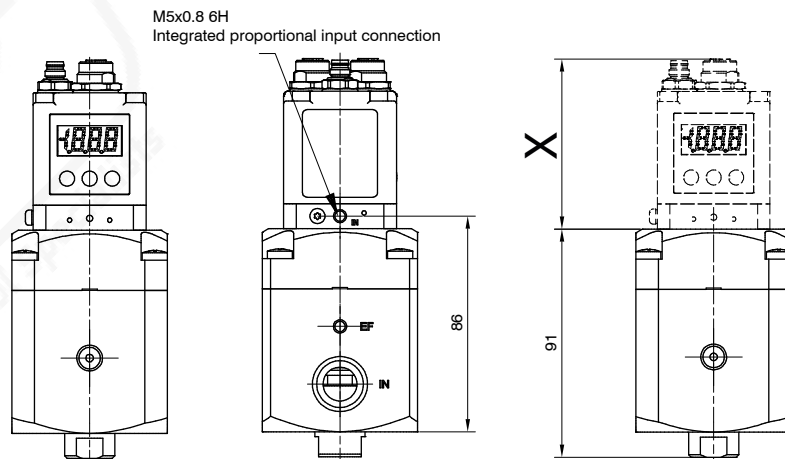


①	FEEDBACK OPTIONS
	1 = Internal feedback E = External feedback
②	PILOTING OPTIONS
	P = M5 connection N = Integrated pilot proportional regulator
②	INTEGRATED PILOT OPTIONS
	DC = SUB-D 15 poles connector current signal, 0-9 bar
	DCA = SUB-D 15 poles connector current signal, 0-9 bar, N.O.
	DT = SUB-D 15 poles connector voltage signal, 0-9 bar
	DTA = SUB-D 15 poles connector voltage signal, 0-9 bar, N.O.
	SC = SUB-D 15 poles connector, CANopen <sup>®</sup> , 0-9 bar
	SCA = SUB-D 15 poles connector, CANopen <sup>®</sup> , 0-9 bar, N.O.
	MC = M12, CANopen <sup>®</sup> , 0-9 bar
	MCA = M12, CANopen <sup>®</sup> 0-9 bar, N.O.
	NCF = M12, current signal, voltage analogue output, 0-9 bar
	NCFA = M12, current signal, voltage analogue output, 0-9 bar, N.O.
	NCG = M12, current signal, current analogue output, 0-9 bar
	NCGA = M12, current signal, current analogue output, 0-9 bar, N.O.
	NCH = M12, current signal, digital output, 0-9 bar
	NCHA = M12, current signal, digital output, 0-9 bar, N.O.
	NTF = M12, voltage signal, voltage analogue output, 0-9 bar
	NTFA = M12, voltage signal, voltage analogue output, 0-9 bar, N.O.
	NTG = M12, voltage signal, current analogue output, 0-9 bar
	NTGA = M12, voltage signal, current analogue output, 0-9 bar, N.O.
	NTH = M12, voltage signal, digital output, 0-9 bar
	NTHA = M12, voltage signal, digital output, 0-9 bar, N.O.
	IB = IO-Link, 0-9 bar
	IBA = IO-Link, 0-9 bar, N.O.
	EC = EtherCAT <sup>®</sup> , 0-9 bar
	ECA = EtherCAT <sup>®</sup> , 0-9 bar, N.O.
	PN = PROFINET, 0-9 bar
PNA = PROFINET, 0-9 bar, N.O.	
EI = EtherNet/IP, 0-9 bar	
EIA = EtherNet/IP, 0-9 bar, N.O.	

AIR SERVICE UNITS



173P12R<sup>①</sup>N<sup>②</sup>



Type	X dimension
Standard - Socket connector	68
CANopen <sup>®</sup> - Socket connector	59
CANopen <sup>®</sup> - M12 connector	71
Standard - M12 connector	71
IO-Link	71
EtherCAT <sup>®</sup>	68
PROFINET IO RT	68
ETHERNET/IP	68



Pilot regulator construction characteristics	
Body	Anodized aluminium
Cover for electrical section	Technopolymer
Seals	NBR
Diaphragm	Cloth-covered rubber
Springs	AISI 302
Actuators	Brass with vulcanised NBR
Weight	168 g
Pilot regulator functional characteristics	
Supply connection	M5
Exhaust connection	Ø1,8
Operating connection	M5
Air consumption	< 1 NI/min
Standby current consumption	70mA
Current consumption with solenoid valves on	400mA
Maximum fittings tightening	3 Nm
Fluid	Air filtered at 5 micron and dehumidified
Protection degree	IP65 (with casing fitted)
** Input Impedance - Current	250 Ω
** Input Impedance - Voltage	10 kΩ
Digital inputs	+ 24 V DC ± 10%
Hysteresis	± Insensitivity
Linearity	± Insensitivity
Discharge flowrate	7 NI/min
Nominal flowrate from 1 to 2 (6 bar ΔP 1 bar)	7 NI/min
Mounting positioning	Indifferent
Outlet pressure	0-9 bar
Maximum inlet pressure	10 bar
Minimum inlet pressure	Desired outlet pressure + 1 bar
Repeatability	± Insensitivity
** Reference Signal - Current	*4 ... 20 mA *0 ... 20 mA
** Reference Signal - Voltage	*0 ... 10 V *0 ... 5 V *1 ... 5 V
Sensitivity	0,01 bar
Environment temperature	-5°C ... 50°C / 23°F ... 122°F
Voltage	+ 24 V DC ± 10% (stabilised with ripple <1%)
** Digital output	+ 24 V DC PNP (Max. current 50 mA)

\* Selectable by keyboard or by RS-232  
\*\* Valid only for devices with analog input

## Installation and operation of the piloting proportional regulator

### PNEUMATIC CONNECTION

The compressed air is connected by means of M5 threaded port in the body.  
Ensure the compressed air entering the unit is filtered for both water and dust down to 5 microns.  
Maximum inlet pressure is 10 Bar.  
The supply pressure to the regulator must always be at least 1 bar greater than the required outlet pressure.

### ELECTRICAL CONNECTION

For the electrical connection a D-SUB 15-pole female connector is used (supplied separately).  
Wire in accordance with the wiring diagram shown below.  
Warning: INCORRECT CONNECTIONS MAY DAMAGE THE DEVICE.

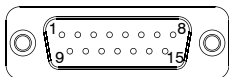
### OPERATING NOTES

If the electric supply is interrupted, the outlet pressure is maintained at the set value.  
However, maintaining the exact value cannot be ensured as it is impossible to operate the solenoid valves.  
In order to discharge the circuit downstream, zero the reference, make sure that the display shows a pressure value equal to zero and then disconnect the electric power supply.  
A version of the device is available that exhausts the downstream circuit when the power supply is removed. (Option A at the end of the part number).  
If the compressed-air supply is suspended and the electric power supply is maintained a whirring will be heard that is due to the solenoid valves; an operating parameter can be activated (P18) that triggers the regulator protection whenever the requested pressure is not reached within 4 seconds of the reference signal being sent.  
In this case the system will intervene to interrupt the control of the solenoid valves. Every twenty seconds, the unit will start the reset procedure until standard operating conditions have been restored.

**Proportional regulator, standard version with socket connector**



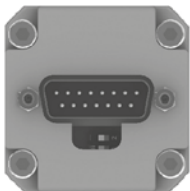
CONNECTOR UPPER VIEW



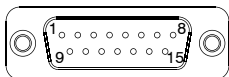
Connector PIN:  
 1 = DIGITAL INPUT 1  
 2 = DIGITAL INPUT 2  
 3 = DIGITAL INPUT 3  
 4 = DIGITAL INPUT 4  
 5 = DIGITAL INPUT 5  
 6 = DIGITAL INPUT 6  
 7 = DIGITAL INPUT 7  
 8 = ANALOGUE INPUT / DIGITAL INPUT 8

9 = SUPPLY (+ 24 V DC)  
 10 = DIGITAL OUTPUT (+ 24 V DC PNP)  
 11 = ANALOGUE OUTPUT (CURRENT)  
 12 = ANALOGUE OUTPUT (VOLTAGE)  
 13 = Rx RS-232  
 14 = Tx RS-232  
 15 = GND

**Proportional regulator, CANopen® version with socket connector**



CONNECTOR UPPER VIEW

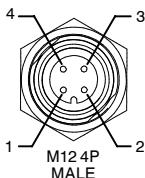


Connector PIN:  
 1 = CAN\_SHIELD  
 2 = CAN\_V+  
 3 = CAN\_GND  
 4 = CAN\_H  
 5 = CAN\_L  
 6 = NC  
 7 = NC  
 8 = NC

9 = POWER SUPPLY (+ 24 V DC)  
 10 = CAN\_SHIELD  
 11 = CAN\_V+  
 12 = CAN\_GND  
 13 = CAN\_H  
 14 = CAN\_L  
 15 = GND

AIR SERVICE UNITS

**Proportional regulator, M12 BASIC and Standard version**



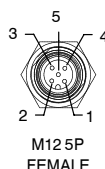
Connector PIN of the M12 BASIC version:  
 1 = ALIMENTAZIONE (+ 24 V DC)  
 2 = NC  
 3 = GND  
 4 = ANALOGUE INPUT

Connector PIN of the M12 Standard version:  
 1 = ALIMENTAZIONE (+ 24 V DC)  
 2 = OUTPUT (depending on model)  
 3 = GND  
 4 = ANALOGUE INPUT

**Proportional regulator, CANopen® version with M12 connector**

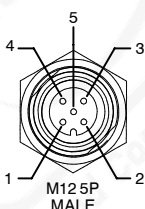


PIN	DESCRIPTION
1	+ 24 V DC (NODE AND INPUTS)
2	NC
3	GND
4	+24 VDC (OUTPUTS)



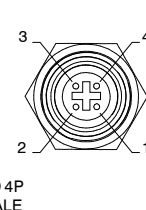
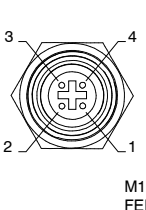
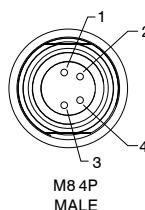
PIN	SIGNAL	DESCRIPTION
1	CAN_SHIELD	Optional Can Shield
2	CAN_V+	Optional Can external positive supply (Dedicated for supply of transceiver and Optocouplers, if galvanic isolation of the bus node applies)
3	CAN_GND	Ground / 0V / V-
4	CAN_H	CAN_H bus line (Dominant high)
5	CAN_L	CAN_L bus line (Dominant low)

**Proportional regulator, IO-Link version**



Connector PIN:  
 1 = L+  
 2 = +24 VDC (P24)  
 3 = L-  
 4 = C/Q  
 5 = GND (N24)

**Proportional regulator, EtherCAT® version, PROFINET IO RT and EtherNet/IP**

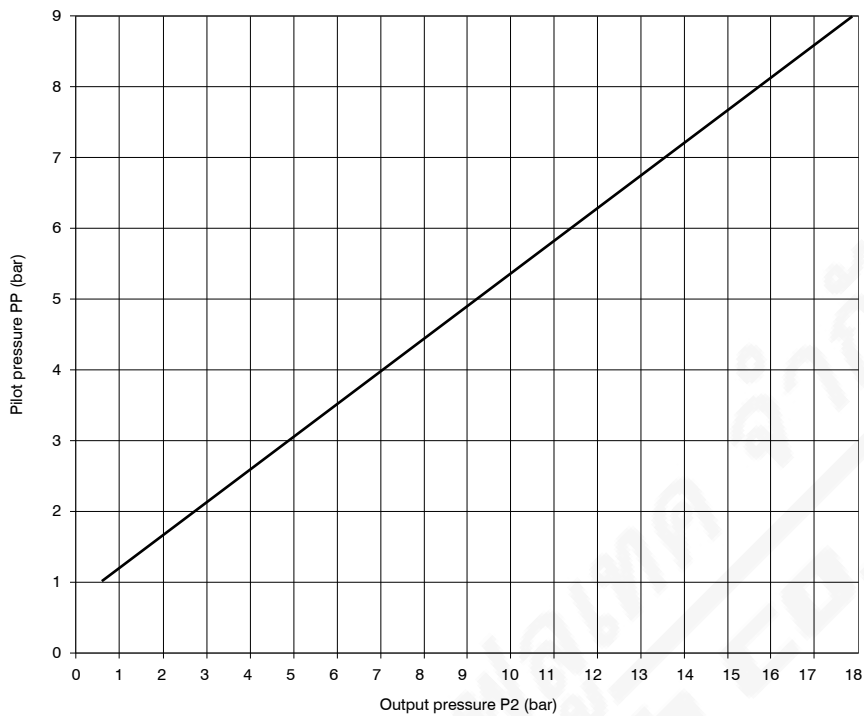


Connector PIN:  
 1 = Device logical power supply  
 2 = NC  
 3 = GND  
 4 = Solenoid valve power supply

Connector PIN:  
 1 = Segnale TX + (Ethernet Transmit High)  
 2 = Segnale RX + (Ethernet Receive High)  
 3 = Segnale TX - (Ethernet Transmit Low)  
 4 = Segnale RX - (Ethernet Receive Low)



Piloting curves



Inlet pressure P1=20bar																	
Piloting pressure	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9
Output pressure	0.6	1.7	2.7	3.7	4.9	5.9	7	8.2	9.7	10.5	11.6	12.7	13.7	14.8	15.8	16.9	18
P1/P2	0.62	1.14	1.36	1.5	1.64	1.69	1.75	1.82	1.94	1.91	1.93	1.95	1.96	1.97	1.98	1.99	2

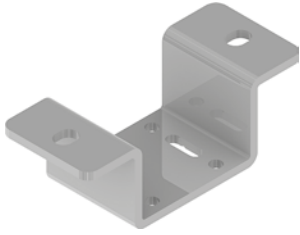
AIR SERVICE UNITS

Outlet pressure/Piloting pressure table

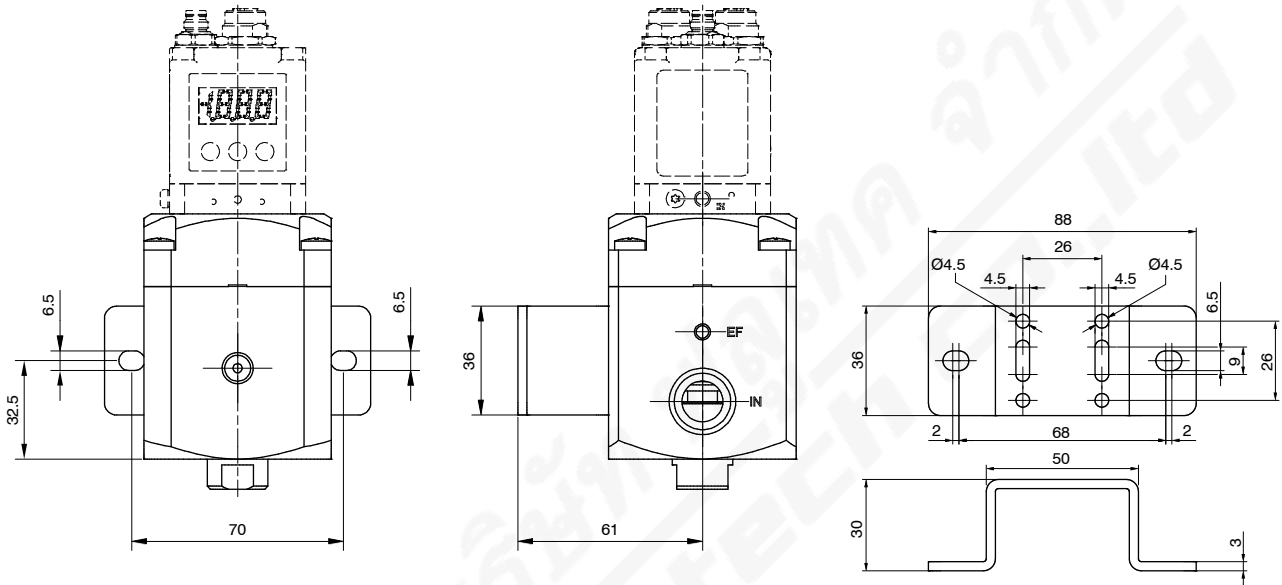
Inlet pressure Main regulator (bar)	Pressure range (bar)									
	1	2	3	4	5	6	7	8	9	10
2	1.6	1	/	/	/	/	/	/	/	/
3	1.6	1.5	1	/	/	/	/	/	/	/
4	1.6	1.8	1.3	1	/	/	/	/	/	/
5	1.5	1.8	1.7	1.3	1	/	/	/	/	/
6	1.4	1.8	1.9	1.5	1.2	1	/	/	/	/
7	1.4	1.7	1.8	1.8	1.4	1.2	1	/	/	/
8	1.4	1.8	1.9	1.9	1.6	1.3	1.1	1	/	/
9	1.3	1.7	1.8	1.9	1.8	1.5	1.3	1.1	1	/
10	1.3	1.7	1.8	1.9	1.9	1.7	1.4	1.3	1.1	1
11	1.4	1.6	1.8	1.9	1.9	1.8	1.6	1.4	1.2	1.1
12	1.3	1.6	1.8	1.8	1.9	1.9	1.7	1.5	1.3	1.2
13	1.3	1.6	1.7	1.8	1.9	1.9	1.9	1.6	1.4	1.3
14	1.2	1.5	1.7	1.8	1.9	1.9	1.9	1.8	1.6	1.4
15	1	1.5	1.7	1.8	1.9	1.9	1.9	1.9	1.7	1.5
16	1	1.5	1.7	1.8	1.8	1.9	1.9	1.9	1.8	1.6
17	/	1.5	1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.7
18	/	1.5	1.7	1.8	1.8	1.9	1.9	1.9	2	1.8
19	/	1.5	1.7	1.8	1.8	1.9	1.9	1.9	2	1.9
20	/	1.5	1.6	1.8	1.8	1.9	1.9	1.9	1.9	2

Fixing bracket

Coding: 17050

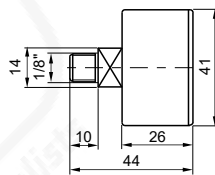


AIR SERVICE UNITS



Pressure gauge

Coding: 17070<sup>V</sup><sup>S</sup>



<b>V</b>	VERSION
	A = Ø40
	SCALE
	A = 0 - 4 bar
<b>S</b>	B = 0 - 6 bar
	C = 0 - 12 bar
	D = 0 - 16 bar
	E = 0 - 20 bar

**POWER SUPPLY and NETWORK connectors**

► **SUB-D 15 pins female connector**



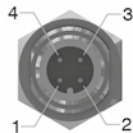
Coding: 5300.F15.Ⓒ.Ⓓ

	CONNECTOR
Ⓒ	10 = In line
	90 = 90° Angle
	CABLE LENGTH
Ⓓ	00 = IP65 with casing, without cable
	03 = 3 meters
	05 = 5 meters

Connector version for standard and CANopen®

**POWER SUPPLY connectors**

► **Straight connector M12A 4P female**



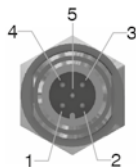
Upper view slave connector

PIN	DESCRIPTION
1	+ 24 V DC (LOGICS AND INPUTS)
2	N.C.
3	0 V
4	+ 24 V DC (OUTPUTS)

Coding: 5312A.F04.00

Connector version for standard and CANopen®

► **Straight connector M12A 5P female**



Upper view slave connector

PIN	DESCRIPTION
1	(CAN_SHIELD)
2	(CAN_V+)
3	CAN_GND
4	CAN_H
5	CAN_L

Coding: 5312A.F05.00

Connector version for IO-Link

**NETWORK connectors**

► **Straight connector M12A 5P male**



Upper view slave connector

PIN	DESCRIPTION
1	(CAN_SHIELD)
2	(CAN_V+)
3	CAN_GND
4	CAN_H
5	CAN_L

Coding: 5312A.M05.00

Connector version for standard and CANopen®

► **Straight connector M12D 4P male**



Upper view slave connector

PIN	SIGNAL	DESCRIPTION
1	TX+	EtherNet Transmit High
2	RX+	EtherNet Receive High
3	TX-	EtherNet Transmit Low
4	RX-	EtherNet Receive Low

Coding: 5312D.M04.00

Connector version for EtherCAT®, PROFINET and EtherNet/IP

**Plugs**

► **M12 plug**



Coding: 5300.T12