

# 2.9

**Valve Terminal Series HBS  
with EtherCAT, PROFINET or D-Sub**

# Valve Terminals – Series HBS

Modular valve terminal system with different electric control modules:

- EtherCAT
- PROFINET
- D-Sub

On request: CANopen, EtherNet/IP

Orifice size: Series 403 – 4 mm – 450 NI/min  
Series 503 – 5 mm – 650 NI/min

Temperature range: -10 ... +80°C  
Pressure range: 3 ... 10 bar  
Voltage: 24VDC, with LED and short circuit protection  
Power consumption: 1,8 Watt  
IP Protection: IP 55

Terminals are equipped with threads for adding DIN-rail mounting clips.



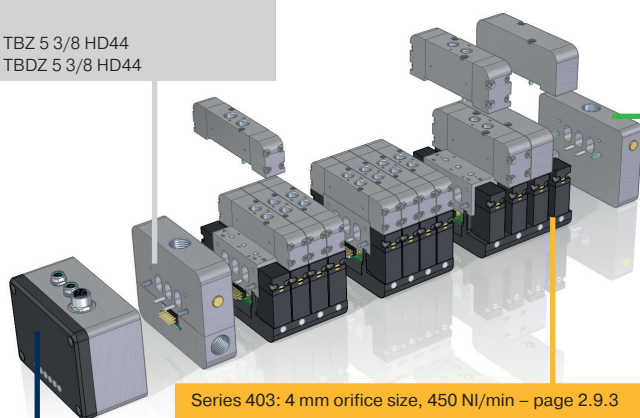
### Additional air supply modules (optionally) – page 2.9.6

For EtherCAT and PROFINET:

Without through-hole TBZ 5 3/8  
With through-hole TBDZ 5 3/8

For D-Sub:

Without through-hole TBZ 5 3/8 HD44  
With through-hole TBDZ 5 3/8 HD44



Main connection module with air supply and exhaust ports – page 2.9.6  
TBG 5 3/8

### Electrical connection modules – page 2.9.2

EtherCAT TBE 5 ECH  
PROFINET TBE 5 PN  
D-Sub TBE 5 HD44

### Series 403: 4 mm orifice size, 450 NI/min – page 2.9.3

**4 station manifold**  
EtherCAT, PROFINET TB 16 5 403 04 EC  
D-Sub TB 16 5 403 04 HD44

**Valves**  
VTB 231 403 Double 3/2 – NC&NC  
VTB 232 403 Double 3/2 – NC&NO  
VTB 233 403 Double 3/2 – NO&NO  
VTB 510 403 5/2 – single solenoid  
VTB 520 403 5/2 – double solenoid  
VTB 531 403 5/3 – centre closed  
VTB 532 403 5/3 – centre exhausted  
VTB 533 403 5/3 – centre pressurised  
VTB 16 BP Blanking plate

### Series 503: 5 mm orifice size, 650 NI/min – page 2.9.3

**4 station manifold**  
EtherCAT, PROFINET TB 22 5 503 04 EC  
D-Sub TB 22 5 503 04 HD44

**Valves**  
VTB 231 503 Double 3/2 – NC&NC  
VTB 232 503 Double 3/2 – NC&NO  
VTB 233 503 Double 3/2 – NO&NO  
VTB 510 503 5/2 – single solenoid  
VTB 520 503 5/2 – double solenoid  
VTB 531 503 5/3 – centre closed  
VTB 532 503 5/3 – centre exhausted  
VTB 533 503 5/3 – centre pressurised  
VTB 22 BP Blanking plate

## How to order a complete terminal

### Example:

ECH	4E	DZ	2K20	F1
Electrical connection module	4 station manifold equipped with 4 x VTB 510 403	Air supply module (optionally), can be put at any position	4 station manifold equipped with 2 x VTB 231 503 and 2 x VTB 520 503	Fixing element (optionally)

### Electrical connection modules

Type	Code
TBE 5 ECH	ECH
TBE 5 HD44	HD44
TBE 5 PN	PN

### Valves

#### Series 403

Type	Code
VTB 231 403	A
VTB 232 403	B
VTB 233 403	C
VTB 510 403	E
VTB 520 403	F
VTB 531 403	G
VTB 532 403	H
VTB 533 403	I
VTB 16 BP	J

#### Series 503

Type	Code
VTB 231 503	K
VTB 232 503	L
VTB 233 503	M
VTB 510 503	N
VTB 520 503	O
VTB 531 503	P
VTB 532 503	Q
VTB 533 503	R
VTB 22 BP	S

### Air supply modules (optionally)

Type	Code
With through-hole	DZ
Without through-hole	Z

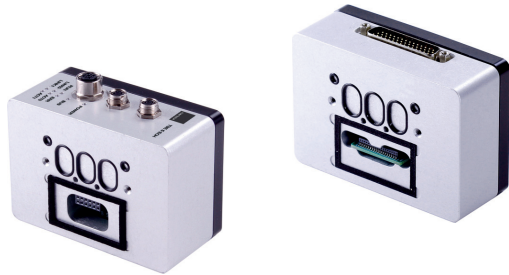
### Fixing elements

Type	Code
DIN-W clip	DIN-W
Fixing element	F1

Please note:

Series 403 and 503 can be mixed in the same terminal, but not on the same 4 station manifold. Connectors have to be ordered separately and can be found on page 2.9.7.

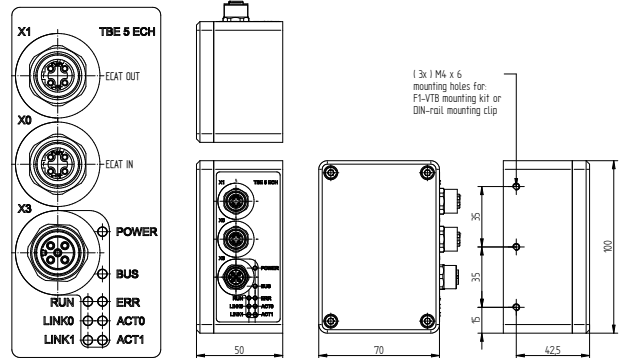
# TBE 5 ECH/ TBE 5 PN/ TBE 5 HD44



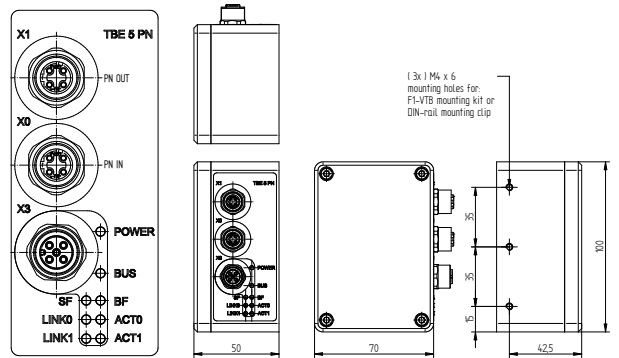
Electric modules with EtherCAT, PROFINET and D-Sub connection.

Supply voltage: 24VDC (+/- 10%)  
 Drive: PNP  
 Maxim. Admissible current [A] 3 per pins

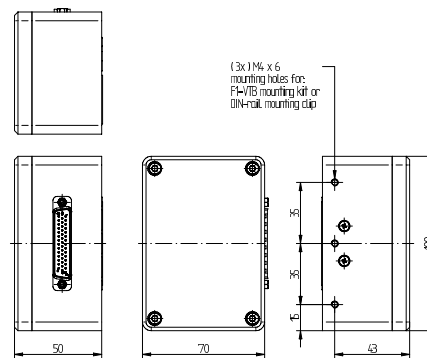
Modules are equipped with threads for adding DIN-rail mounting clips.  
 Connectors and fixing accessories can be found on page 2.9.7.



**TBE 5 ECH**



**TBE 5 PN**



**TBE 5 HD 44**

Type	Connection	Electrical connection [24VDC]	Max. number of valves	Maximum current at 24VDC [A]	Weight
TBE 5 ECH	EtherCAT	M12 connector - X3: Power M12 connector - X0: EtherCAT IN M12 connector - X1: EtherCAT OUT	32 valves (64 solenoids)	5	0,5 kg
TBE 5 PN	PROFINET	M12 connector - X3: Power M12 connector - X0: PROFINET IN M12 connector - X1: PROFINET OUT	32 valves (64 solenoids)	5	0,5 kg
TBE 5 HD44	D-Sub	44-pin connector	16 valves (32 solenoids)	2,4	0,5 kg

# TB 16 5 403 04 EC / TB 16 5 403 04 HD44 TB 22 5 503 04 EC / TB 22 5 503 04 HD44



Modular valve terminal system for common connection to ports 1 (pressure), 3 and 5 (exhaust). Ports 2 and 4 are located in the valves with G1/8 thread.

Each manifold provides four valve stations. The 24VDC solenoid system is part of the manifold and is equipped with a manual override to turn as well as LED and varistor.

For the HD44 (D-Sub) system a maximum of four manifolds can be combined which means that the terminal can be equipped with a maximum of 16 pieces double-solenoid valves.

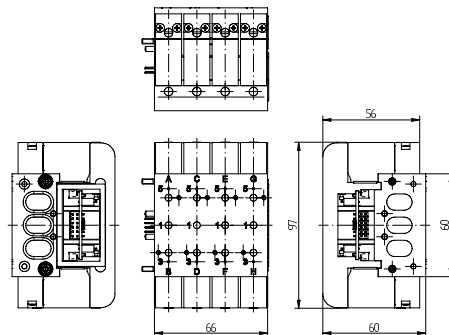
For the EC (EtherCAT and PROFINET) system a maximum of eight manifolds can be combined which means that the terminal can be equipped with a maximum of 32 pieces double-solenoid valves.

The electronics of the base distribute the signals coming from the electrical connection module between the pilot valves. The system can be built and taken apart just by operating two internal threaded cylinder screws.

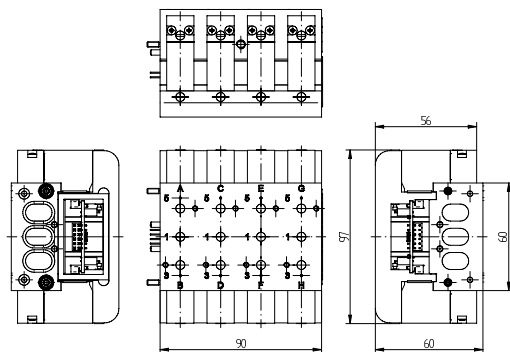
Additional manifolds and intermediate air supply modules can be added at any position.

The valves are mounted from top onto the manifolds. Blanking plates are also available type VTB 16 BP (series 403) and VTB 22 BP (series 503).

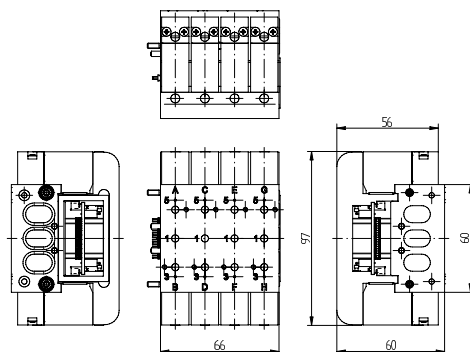
The valve terminal will be equipped and tested by the manufacturer. Please advise configuration.



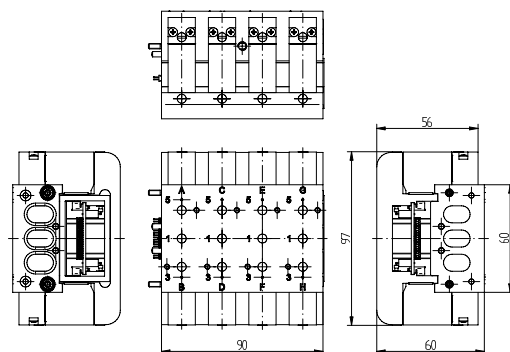
**TB 16 5 403 04 EC**



**TB 22 5 503 04 EC**



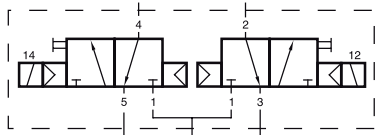
**TB 16 5 403 04 HD44**



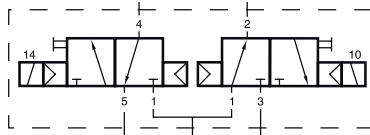
**TB 22 5 503 04 HD44**

Type	Connection	Series	Orifice size	Weight
TB 16 5 403 04 EC	EtherCAT, PROFINET	403	Ø 4 mm	0,70 kg
TB 22 5 503 04 EC	EtherCAT, PROFINET	503	Ø 5 mm	0,83 kg
TB 16 5 403 04 HD44	D-Sub	403	Ø 4 mm	0,70 kg
TB 22 5 503 04 HD44	D-Sub	503	Ø 5 mm	0,83 kg

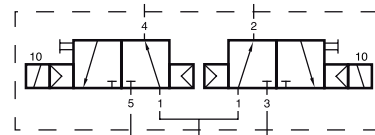
# VTB 23\_403/VTB 23\_503



VTB 231 403  
VTB 231 503



VTB 232 403  
VTB 232 503



VTB 233 403  
VTB 233 503



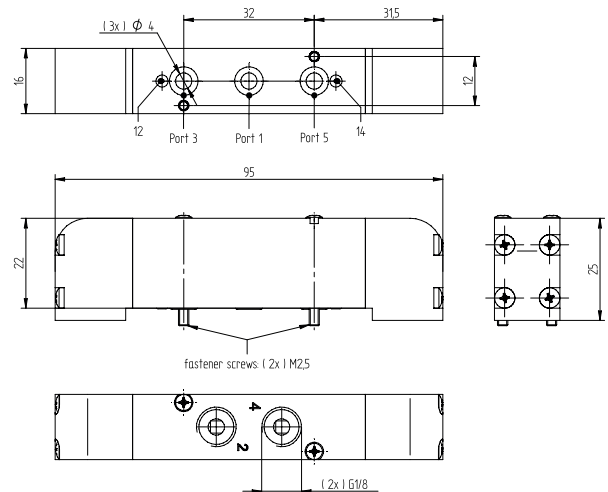
Double 3/2-way valve actuated by permanent signal and equipped with air spring return.

- Type 231 NC & NC
- Type 232 NC & NO
- Type 233 NO & NO

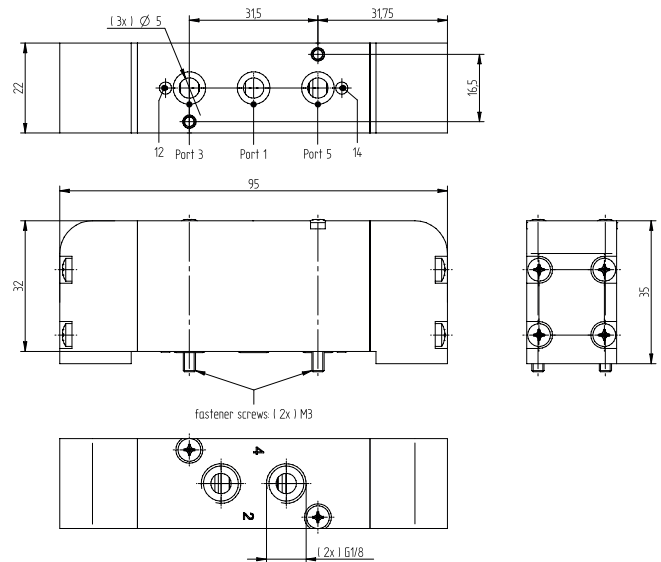
When ordering please complete the type number by 1, 2 or 3 according to the type required.

24V= solenoid is part of the 4-station manifold plate displayed on page 2.9.3.

Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.



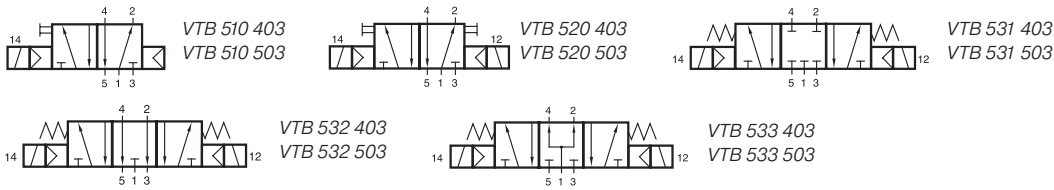
**VTB 23\_403**



**VTB 23\_503**

Type	Ports 2,4	Air flow	Operating press.	Power consumption	Weight
VTB 23_403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 23_503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg

# VTB 510 403/VTB 520 403/VTB 53\_ 403 VTB 510 503/VTB 520 503/VTB 53\_ 503



### VTB 510 403 / VTB 510 503

5/2-way valve actuated by permanent signal and equipped with air spring return.

### VTB 520 403 / VTB 520 503

5/2-way double pilot valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical signal.

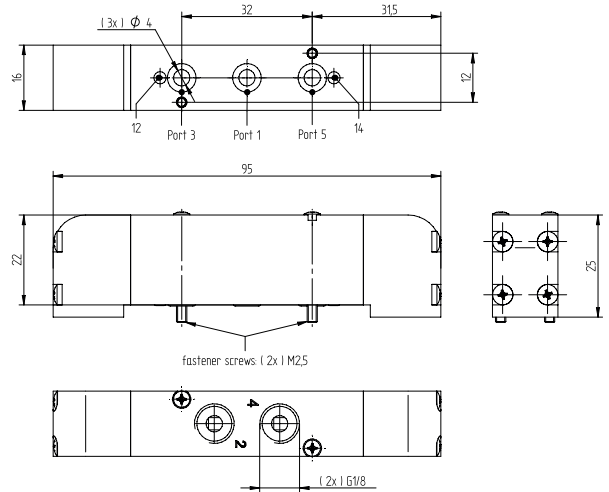
### VTB 53\_ 403 / VTB 53\_ 503

5/3-way valve with spring return to middle position, actuated by permanent signal.

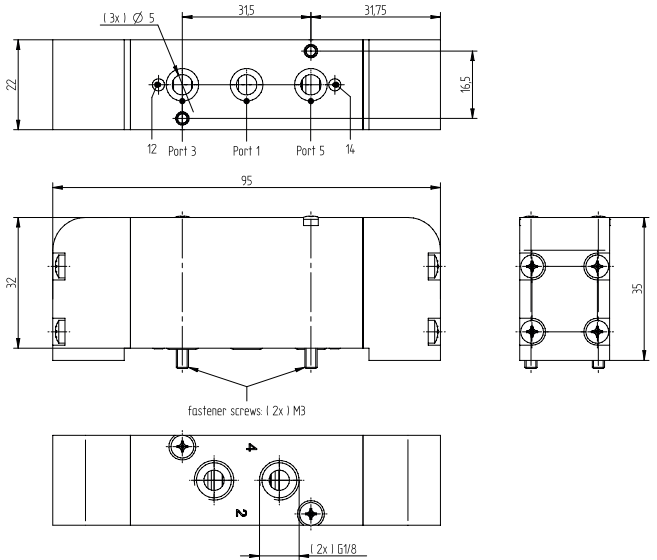
- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

*When ordering please complete the type number by 1, 2 or 3 according to the type required.*

24V= solenoid is part of the 4-station manifold plate displayed on page 2.9.3.  
Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.



**VTB 5\_ 403**



**VTB 5\_ 503**

Type	Ports 2,4	Air flow	Operating press.	Power consumption	Weight
VTB 510 403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 510 503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg
VTB 520 403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 520 503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg
VTB 53_ 403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 53_ 503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg

# TBG 5 3/8 /TBZ 5 3/8 /TBDZ 5 3/8 TBZ 5 3/8 HD44 /TBDZ 5 3/8 HD44



Main connection module and modules for intermediate air supply. Air supply and exhaust ports threaded G 3/8". Orifice size 10 mm, 2.500 NI/min.

Modules are equipped with threads for adding DIN-rail mounting clips.

**TBG 5 3/8:**

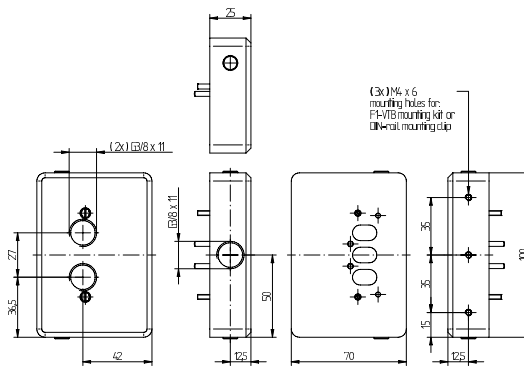
Main connection module with air supply and exhaust ports.

**TBZ 5 3/8 (HD44):**

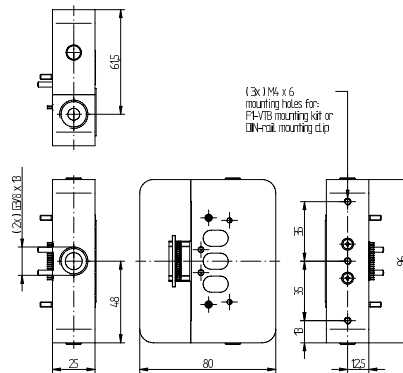
Intermediate air supply module without through-hole. Interrupts pressure supply. Module can be used to operate the valve terminal with different pressures.

**TBDZ 5 3/8 (HD44):**

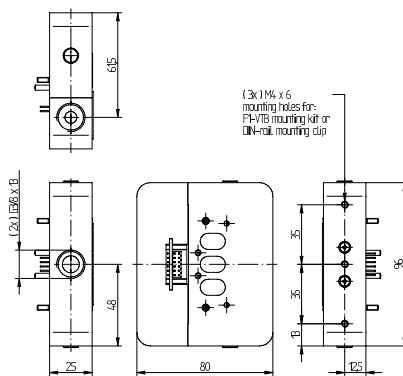
Intermediate air supply module with through-hole to increase the air volume.



**TBG 5 3/8**



**TBZ 3/8 / TBDZ 5 3/8**



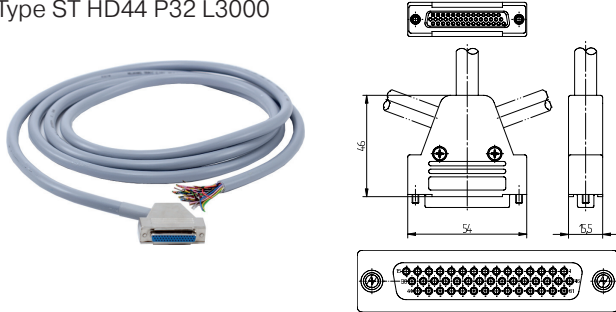
**TBZ 5 3/8 HD44 / TBDZ 5 3/8 HD44**

Type	Function	Connection	Weight
TBG 5 3/8	Main connection module	EtherCAT, PROFINET, D-Sub	0,44 kg
TBZ 5 3/8	Intermediate air supply, without through-hole	EtherCAT, PROFINET	0,45 kg
TBDZ 5 3/8	Intermediate air supply, with through-hole	EtherCAT, PROFINET	0,45 kg
TBZ 5 3/8 HD44	Intermediate air supply, without through-hole	D-Sub	0,45 kg
TBDZ 5 3/8 HD44	Intermediate air supply, with through-hole	D-Sub	0,45 kg

# Connectors and fixing accessories

## Connector for D-Sub

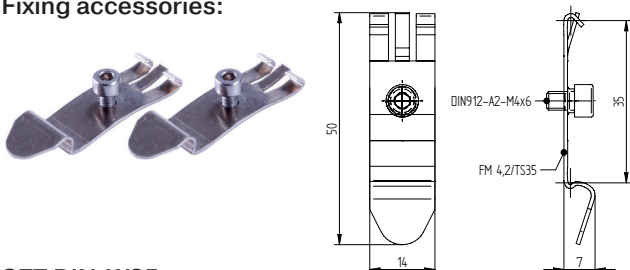
Straight electrical connector for D-sub terminals.  
 Cable can be offset by 2 x 90°.  
 Standard cable length 3000 mm, others on request.  
 Type ST HD44 P32 L3000



Position	Solenoid	PIN	Colour	PIN
1	A	1	white	1
1	B	2	brown	2
2	A	3	green	3
2	B	4	yellow	4
3	A	5	gray	5
3	B	6	pink	6
4	A	7	blue	7
4	B	8	red	8
5	A	9	black	9
5	B	10	violet	10
6	A	11	gray-pink	11
6	B	12	red-blue	12
7	A	13	white-green	13
7	B	14	brown-green	14
8	A	15	white-yellow	15
8	B	16	yellow-brown	16
9	A	17	white-gray	17
9	B	18	gray-brown	18
10	A	19	white-pink	19
10	B	20	pink-brown	20
11	A	21	white-blue	21
11	B	22	brown-blue	22
12	A	23	white-red	23
12	B	24	brown-red	24
13	A	25	white-black	25
13	B	26	brown-black	26
14	A	27	gray-green	27
14	B	28	yellow-gray	28
15	A	29	pink-green	29
15	B	30	yellow-pink	30
16	A	31	green-blue	31
16	B	32	yellow-blue	32

Pin 33-44 common GND  
 Please count position of solenoid from the electrical connection module.  
 Solenoids A and B are marked on the electrical connection module.

## Fixing accessories:



### SET DIN-W35

2 pieces of DIN-clips with screws which can be assembled to TBE/TBG/TBZ and TBDZ modules.  
 Width 14 mm / height 50,0 mm / depth 7 mm

## Connectors for EtherCAT / PROFINET

*Industrial Ethernet Cable*  
 M8 – RJ45, straight, 4-pin  
 Type ST EC M8M-RJ45-2M

*Industrial Ethernet Cable*  
 M8 – M8, straight  
 Type ST EC M8M-M8M-2M

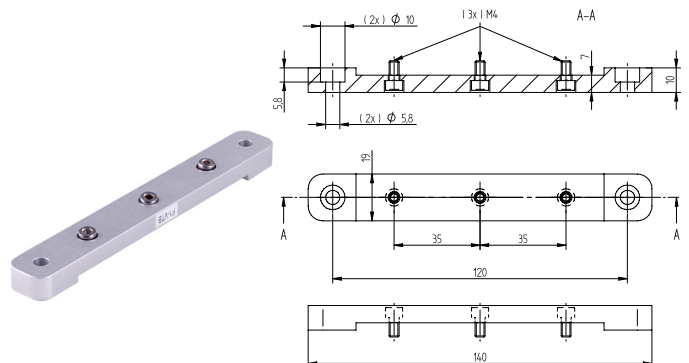


- Ethernet cable: 4-pin, AWG 26
- CAT 5E acc. to ISO/IEC 11801, EN 50173, EIA/TIA 568-A
- Jacket material: PUR
- Shielding: Aluminum-laminated polyester film, copper braid
- Jacket diameter: 4.8 mm
- Suitable for drag chain use
- UV resistant
- Oil resistant acc. to IEC 60811-2-1 and DIN VDE 0282 part 10
- Free from silicone, PVC and LABS
- Free from halogen acc. to IEC 60754-2
- Flame retardant acc. to IEC 60332-1-2
- Approval: cULus
- RoHS compliant
- Protection class IP67
- Cable length: 2.0 m

*Power supply cable*  
 Type ST PS M12M-5P-2M



- Male M12, straight, 5-pin
- Jacket material: PUR
- Suitable for drag chain use
- Resistant to chemicals, UV radiation and oils
- Flame retardant (FT2 acc. to UL 1581, IEC 60332-2-2)
- Resistant to welding sparks
- Free from halogen, silicone, PVC and LABS
- Particularly resistant to abrasion
- Approval: cULus
- RoHS compliant
- Protection class: IP67, IP69K
- Cable length: 2.0 m



### F1-VTB

Fixing element with screws which can be assembled to the TBE, TBZ, TBDZ and TBG modules.