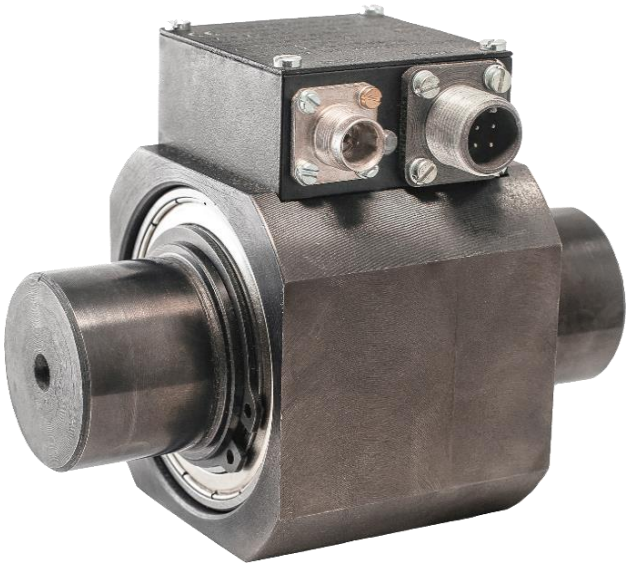
TILKOM
TRANSDUCERS & TELEMETRY

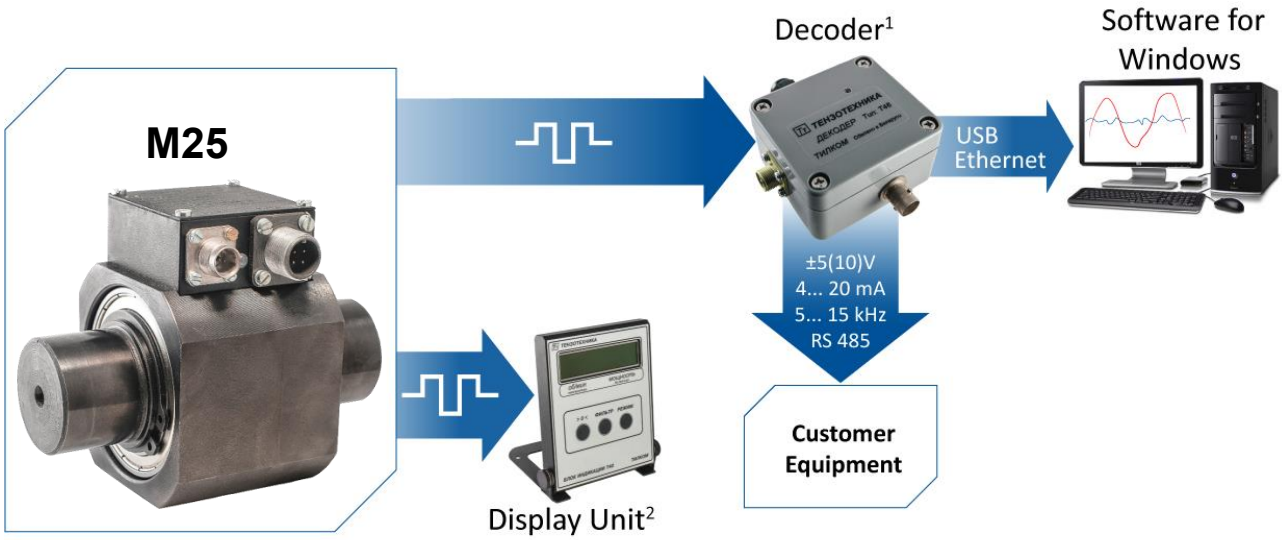
M25

Torque Transducer



Design features

- ✓ **Torque measurement: M_N ±10… ±2 000 Nm**
- ✓ **Rotational speed measurement**
- ✓ **Temperature measurement**
- ✓ **On line determination of mechanical power**
- ✓ **Accuracy class 0.1**
- ✓ **Digital telemetry**
- ✓ **Sample rate 5 kHz**
- ✓ **A/D conversion 16 bit**
- ✓ **“Transducer” software for Windows included**



1) The decoder provides one of the listed output interfaces to choose from.

2) The display unit and the decoder can be connected to the sensor either separately or together.

Specifications

Nominal torque and maximum rotational speed

Type	Nominal (rated) torque, M_N	Max. rotational speed, rpm
M25-5…30	5Nm 6Nm 8 Nm 10 Nm 15 Nm 20Nm 25Nm 30Nm	12 000
M25-50…120	50Nm 60Nm 80Nm 100Nm 120Nm	12 000
M25-150…300	150Nm 200Nm 250Nm 300Nm	10 000
M25-400…1κ	400Nm 500Nm 600Nm 800Nm 1000Nm	8 000
M25-1,2κ…2κ	1.2kNm 1.5kNm 2kNm	6 000

Nominal torque measurement range: - M_N to + M_N. The negative sign means counterclockwise torque; the positive sign means the clockwise torque.
Extended torque measurement range (approx.): - 1.07M_N to + 1.07M_N

Accuracy class		**0.1**
Combine error, including nonlinearity and hysteresis, related to the nominal torque	%	<±0.1
Temperature effect per 10°C on the zero signal, related to the nominal output value	%/10°C	<±0.05
A/D conversion	bit	16
Sample rate	kHz	5.0
Supply voltage	V (DC)	12…30
Power consumption	W	<5
Transducer identification		Auto Identification
Frequency output (T23 Decoder)		
Frequency output signal with positive nominal toque	kHz	15 (90)
Frequency output signal with negative nominal toque	kHz	5 (30)
Frequency output signal at toque = zero	kHz	10 (60)
Load resistance	kΩ	≥2
Amplitude of output signal	V	5±1(symmetrical meander)
Input-output galvanic isolation		+
Analogue output (T24 Decoder)		
Nominal output signal with positive nominal toque	V	+5(+10)
Nominal output signal with negative nominal toque	V	-5(-10)
Output signal at toque = zero	V	0
Load resistance	kΩ	≥10
Measurement frequency range	Hz	0…1000 (-1.5 dB)
Analogue output (T24/4 …20 mA Decoder)		
Output current	mA	4…20
Output current with nominal positive torque	mA	20
Output current with nominal negative torque	mA	4
Output current at torque = zero	mA	12
Maximum load resistance	Ω	100
Measurement frequency range	Hz	0…1000 (-1.5 dB)
Digital output (T45 Decoder)		
Interface		USB 2.0
Data transfer rate (Full-Speed)	Mbit/sec	12
Input-output galvanic isolation		+
Digital output (T46 Decoder)		
Interface		RS485
Protocol		MODBUS RTU
Data transfer rate	baud	2400 – 115200
Parity check		+
Input-output galvanic isolation		+
Digital output (T42 Decoder)		
Interface		RS232
Protocol		MODBUS RTU
Data transfer rate	baud	2400 – 115200
Parity check		+
Input-output galvanic isolation		+

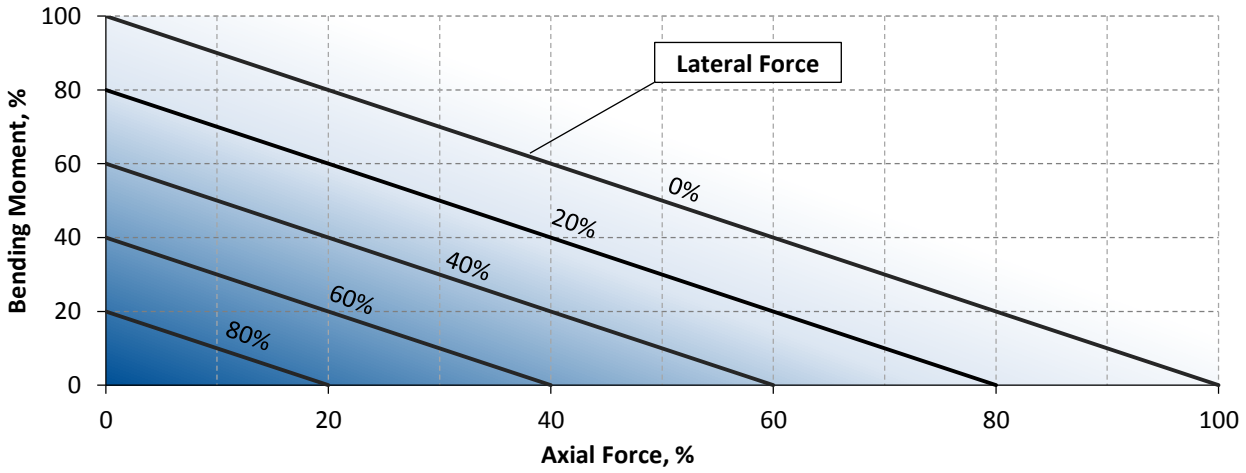
Digital output (T42 Ethernet Indicator-Decoder)		
Interface		Ethernet
Protocol		TCP/IP
Data transfer rate	Mbit/sec	10 and 100
Input – output galvanic isolation		+
Rotational speed measuring system		
Type of measurement system		optical
Relative measurement error at the digital output	%	≤±0,1
Minimum measurable rotational speed	rpm	30 (15, 8, 4)
Amplitude of pulses at the frequency and analogue output (T23, T24 decoder)	V	5±10%
Number pulses per revolution at the frequency and analogue output (T23, T24 decoder)		1, 60, 120
Load resistance (T23, T24 decoder)	kΩ	10
Resistance to environmental influences and mechanical stress		
Nominal temperature range	°C	0…+60
Humidity	%	95 (+35°C)
Atmospheric pressure	kPa	84…106.7 (630…800 mm Hg)
Storage temperature range	°C	-10…+70
Storage humidity	%	95 (+ 30°C)
Vibration resistance: Frequency range Duration Acceleration	 Hz h m/s^2	 10…55 1 40
Impact resistance: Number of impacts Duration Acceleration	 n ms m/s^2	 1000 10 400
Degree of protection		IP 40

Mechanical parameters and operating limitations

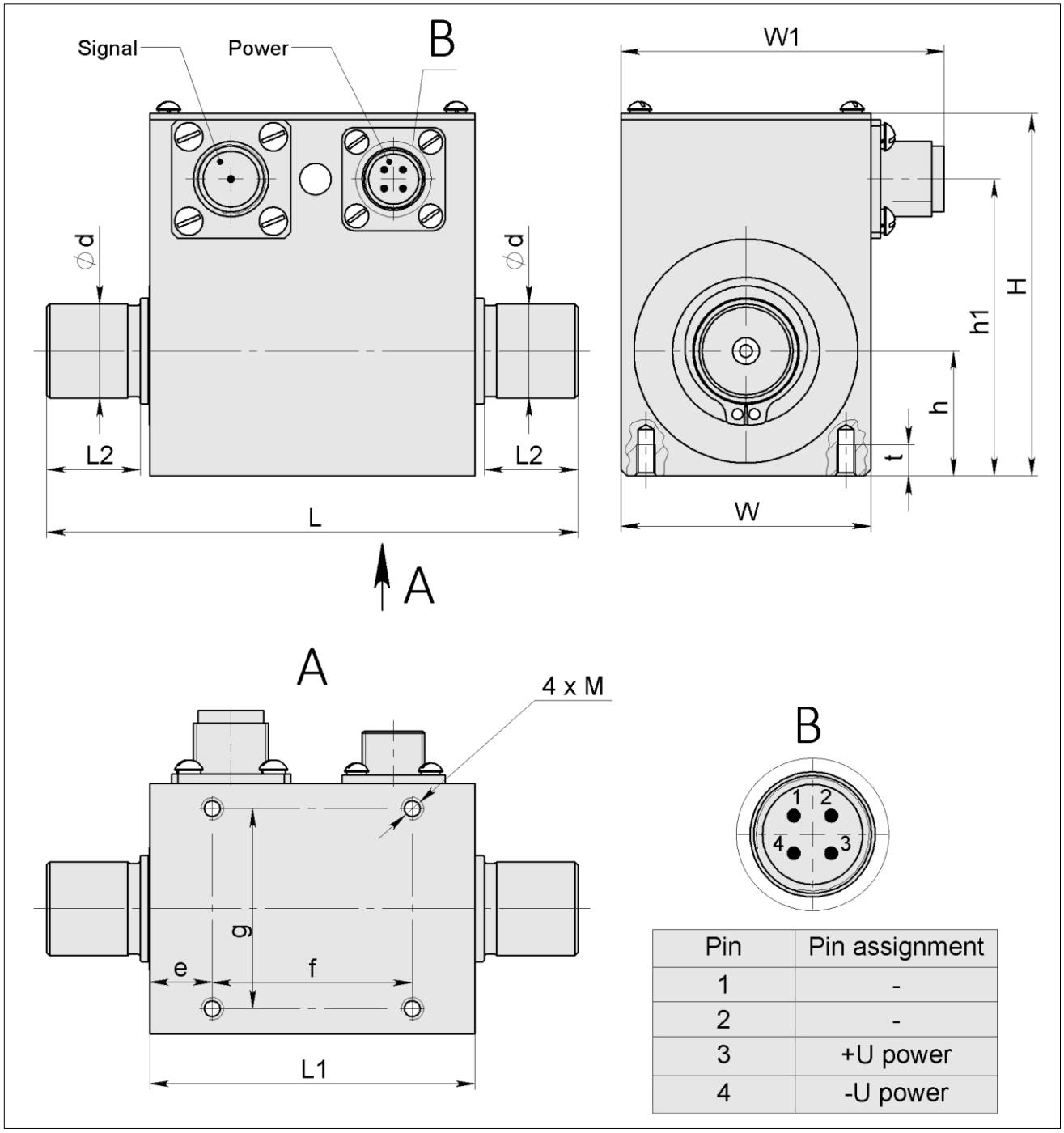
Nominal torque M_N	Nm	5-8	10-30	40-120	150-300	400-1000	1200-2000
Limit torque, related to M_N	%	120					
Axial limit force on the rotor	kN	0.5	1.0	1.5	3.0	8.0	16.0
Lateral limit force on the rotor	N	10	30	80	120	600	1 000
Bending limit moment on the rotor	Nm	0.5	2.0	10.0	20.0	80.0	150
Lateral limit force on the mounting plane of the stator	N	10	30	80	100	500	800
Torsional stiffness	kNm/rad	0.5	3.6	28.0	89.0	380	837
Weight:	kg	0.6	0.6	1.5	2.0	3.9	5.5

Axial force, radial force and bending moment have to be reduced according to the graph 1, if they act together.

Permissible external forces acting on the rotor



M25-5 Nm… 300 Nm Dimensions (in mm)

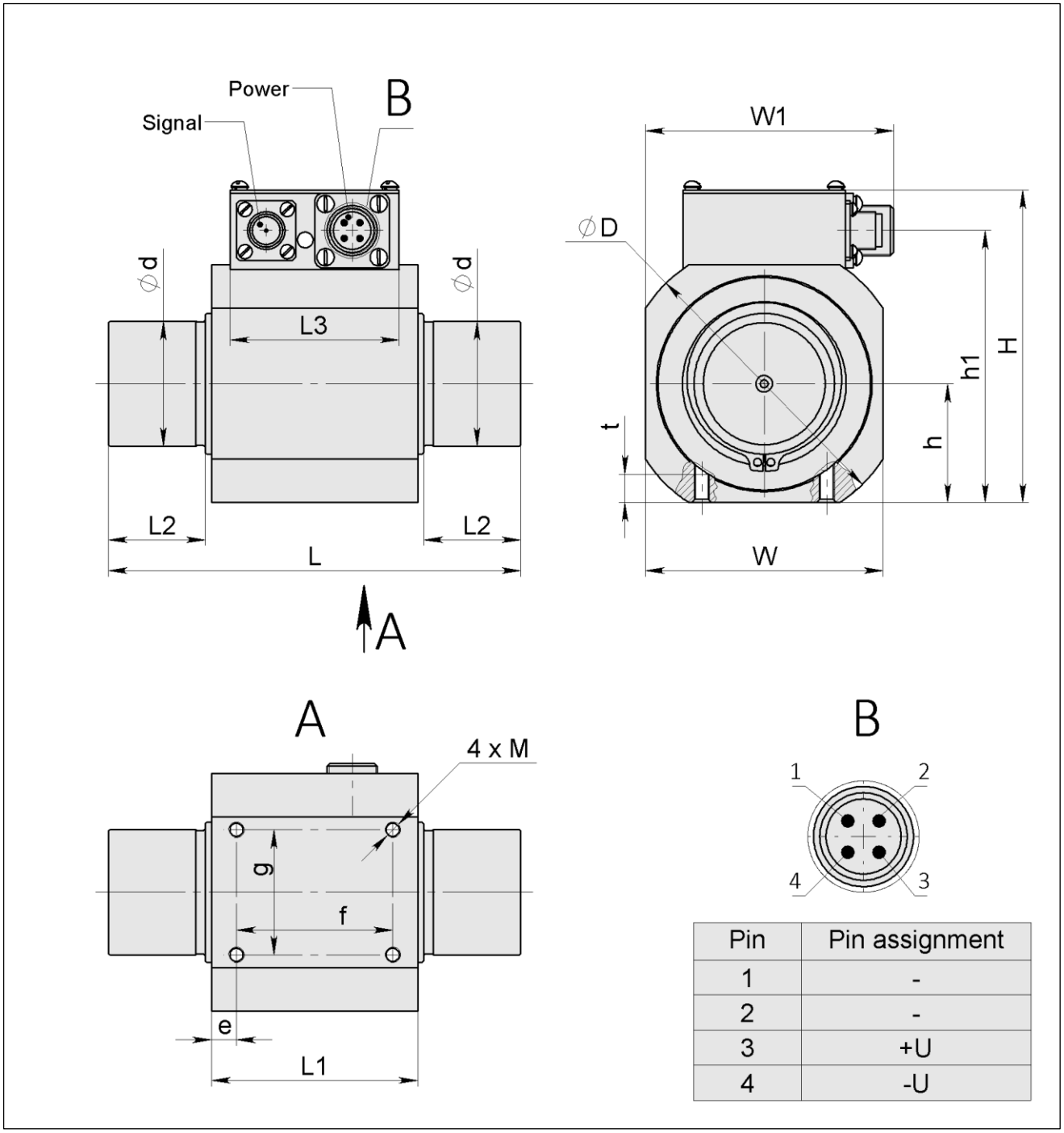


Pin	Pin assignment
1	-
2	-
3	+U power
4	-U power

Nominal torque M_N, Nm	Ød	L	L1	L2	W	W1	H
5… 30	15 g6	85	52	15	40	52	58
50… 120	20 g6	94	52	20	48	60	67
150… 300	24 g6	100	52	23	52	64	71

Nominal torque M_N, Nm	h	h1	e	f	g	M	t
5… 30	20,0	47,5	10	32	32	M3	5,0
50… 120	24,0	56,0	7	38	38	M4	6,5
150… 300	26,5	60,0	7	38	40	M4	6,5

M25-400 Nm… 2000 Nm Dimensions (in mm)

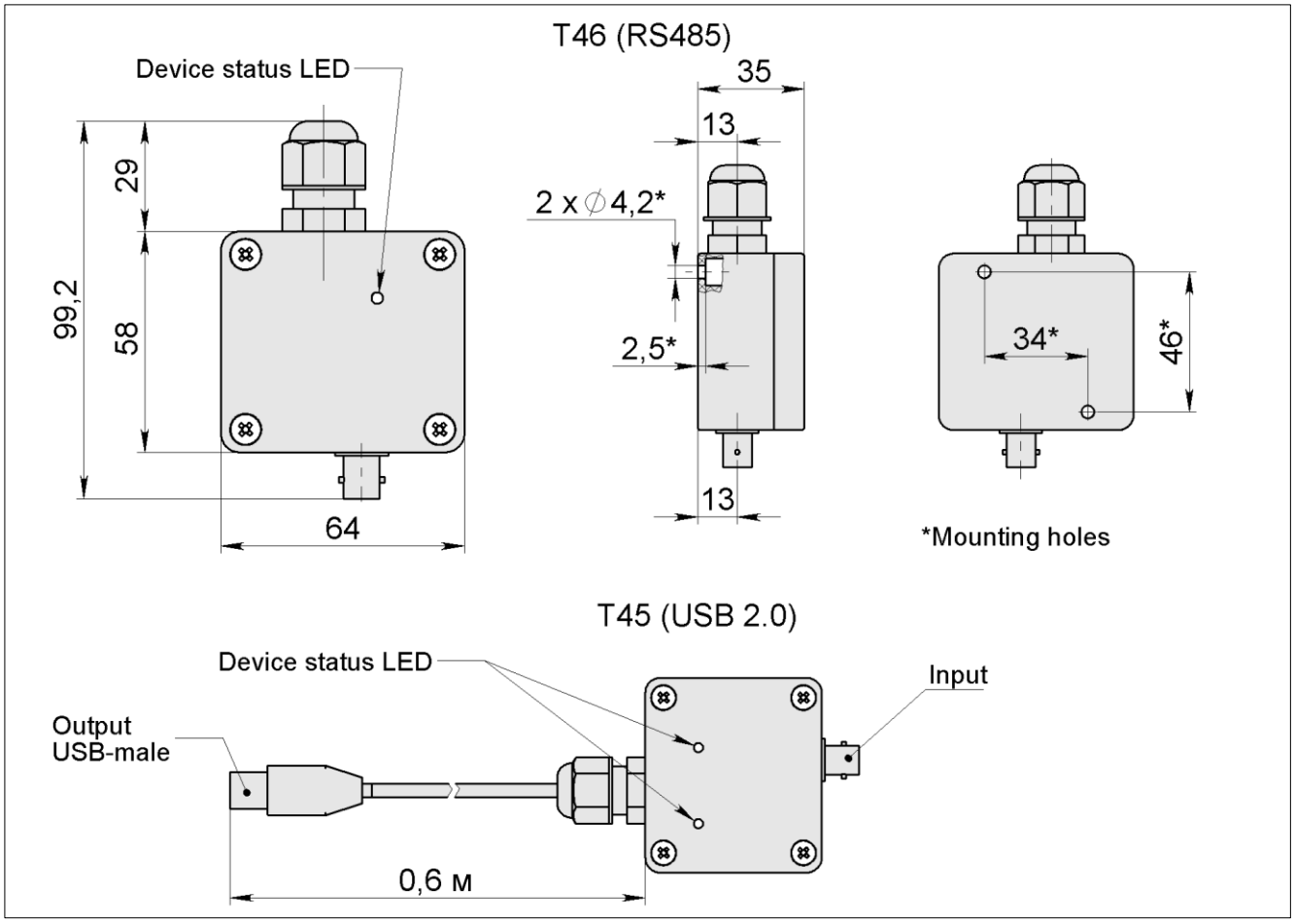


Pin	Pin assignment
1	-
2	-
3	+U
4	-U

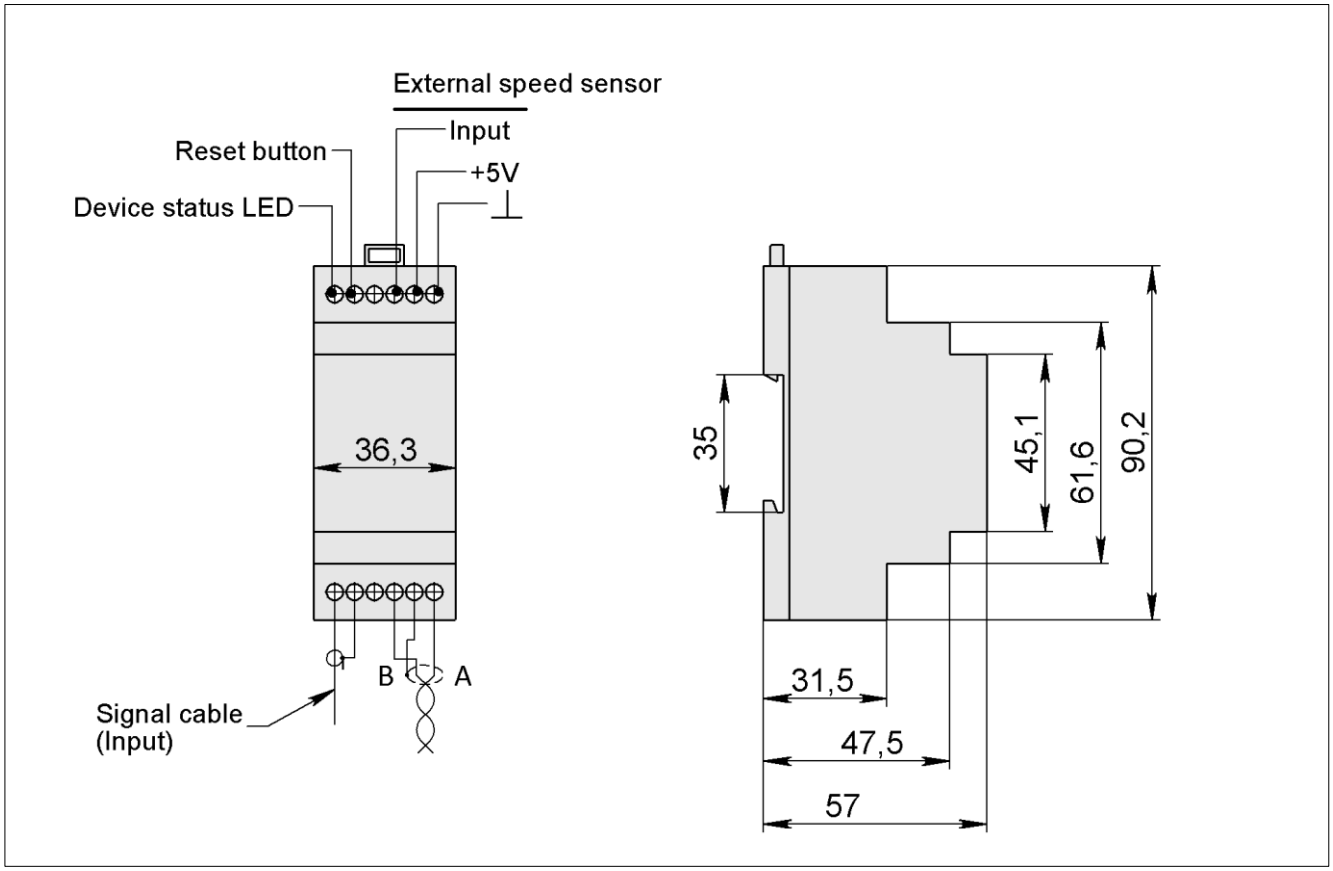
Nominal torque M_N, Nm	Ød	L	L1	L2	L3	W	W1	ØD
400… 1000	40 g6	132	66	31	54	76	80	90
1200…2000	50 g6	150	76	35	54	88	86	100

Nominal torque M_N, Nm	H	H	h1	E	G	F	M	t
400… 1000	100	38	87	8	40	50	M5	10
1200…2000	112	44	99	14	40	50	M5	10

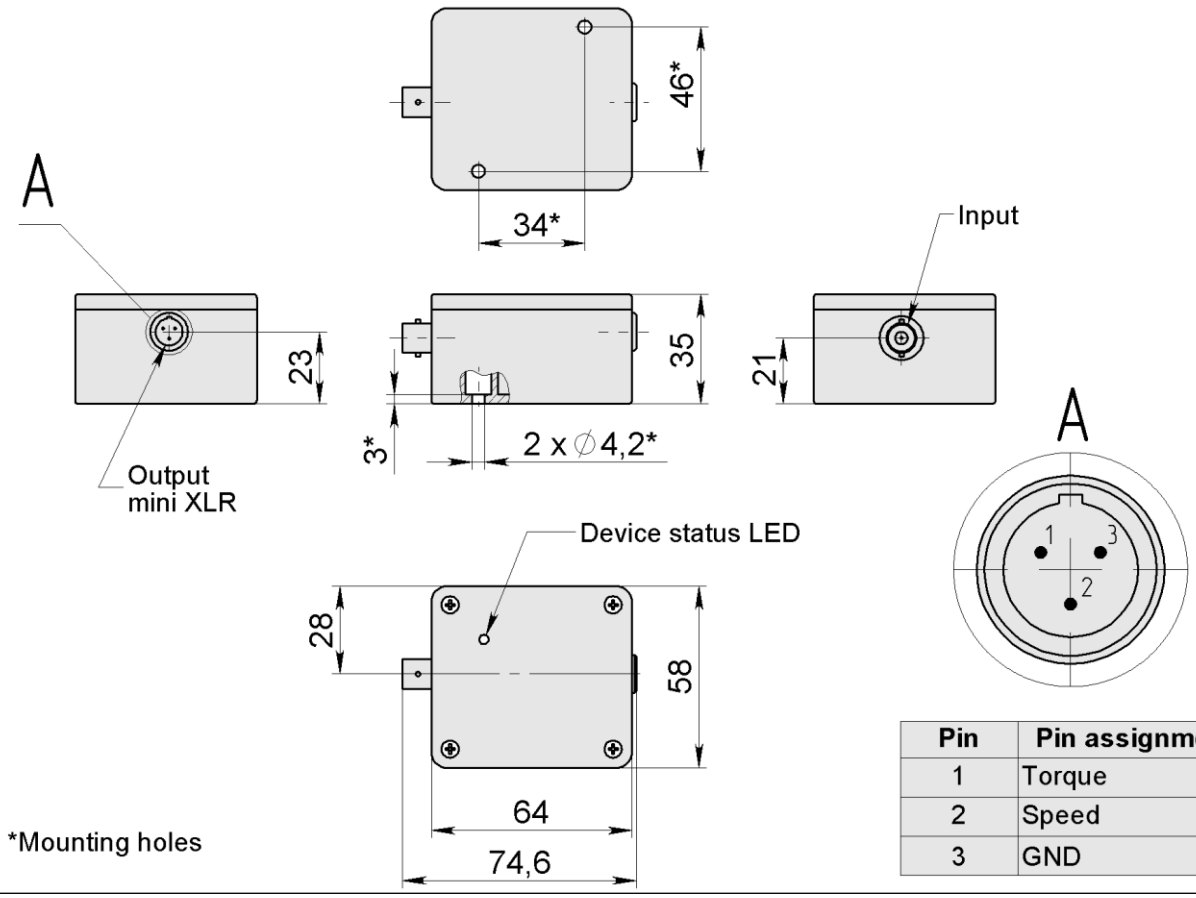
Digital decoder T45, T46 Dimensions (in mm)



Decoder T46 in 35 mm DIN rail housing T46 Dimensions (in mm)

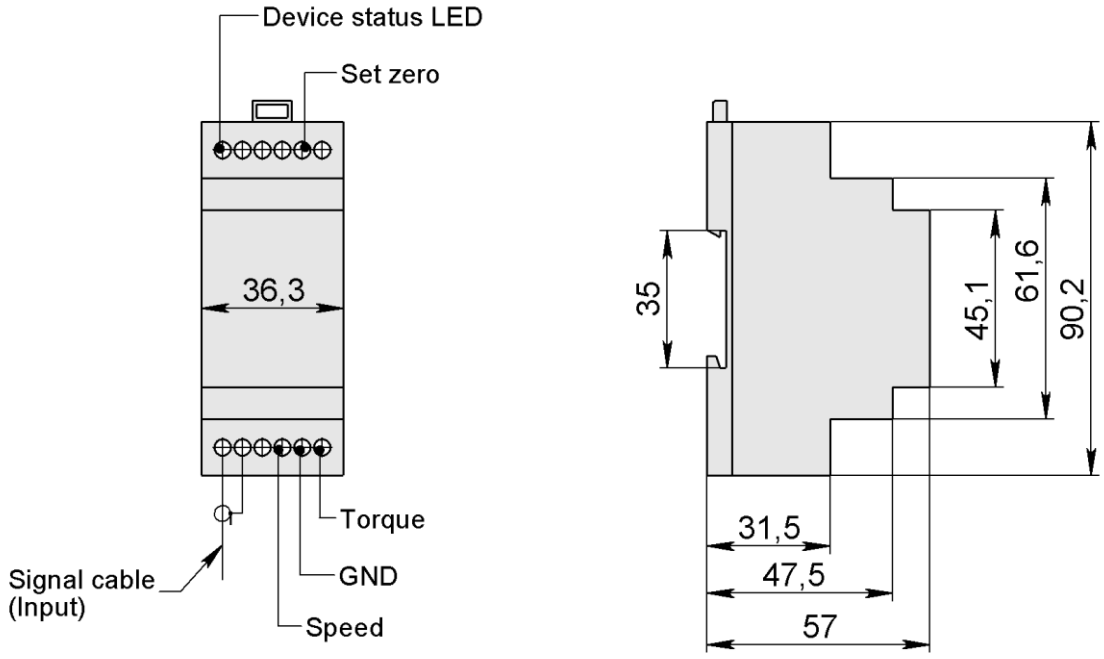


Analogue decoder T24 Dimensions (in mm)

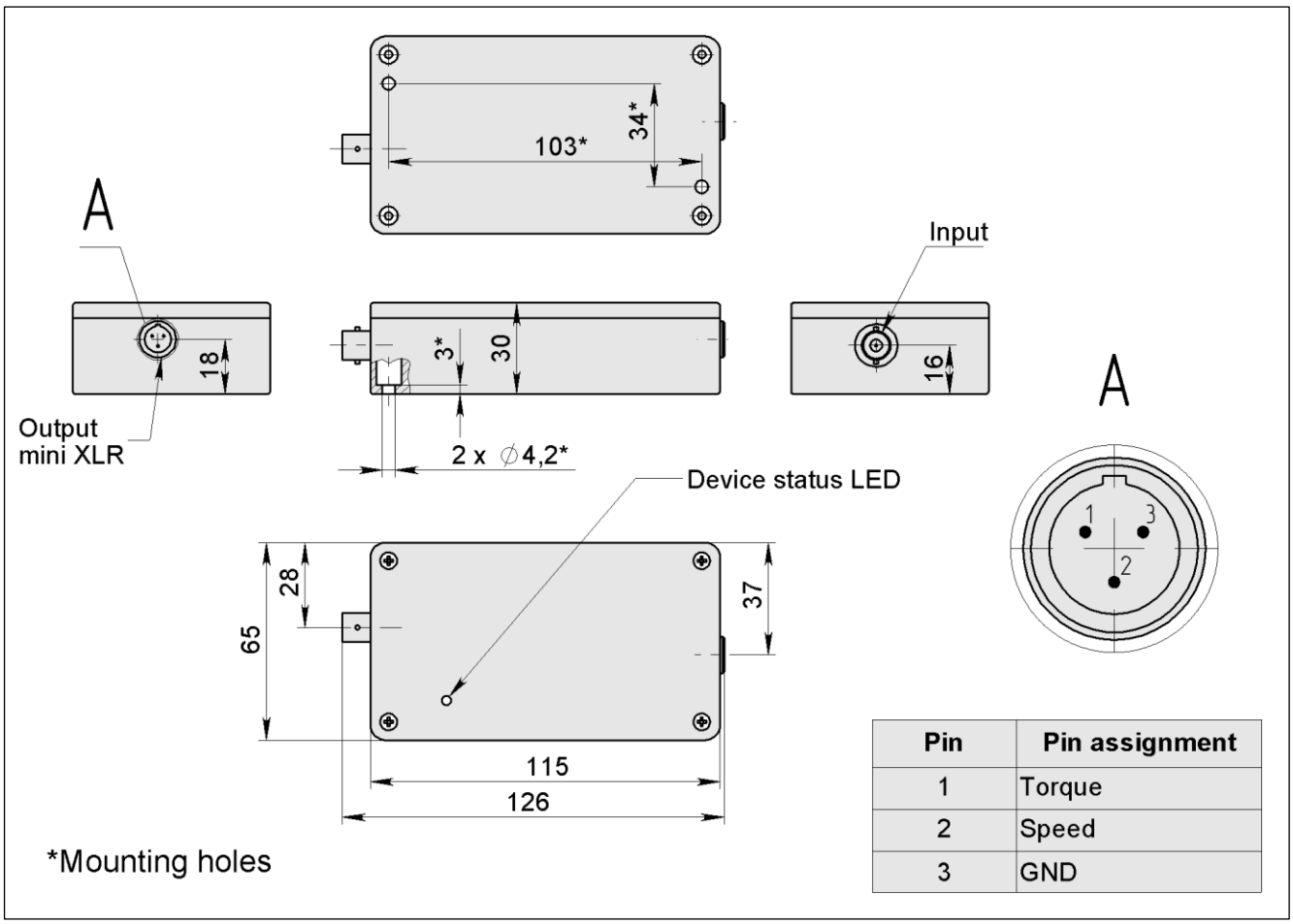


Pin	Pin assignment
1	Torque
2	Speed
3	GND

Analogue decoder T24 in 35 mm DIN rail housing Dimensions, (in mm)



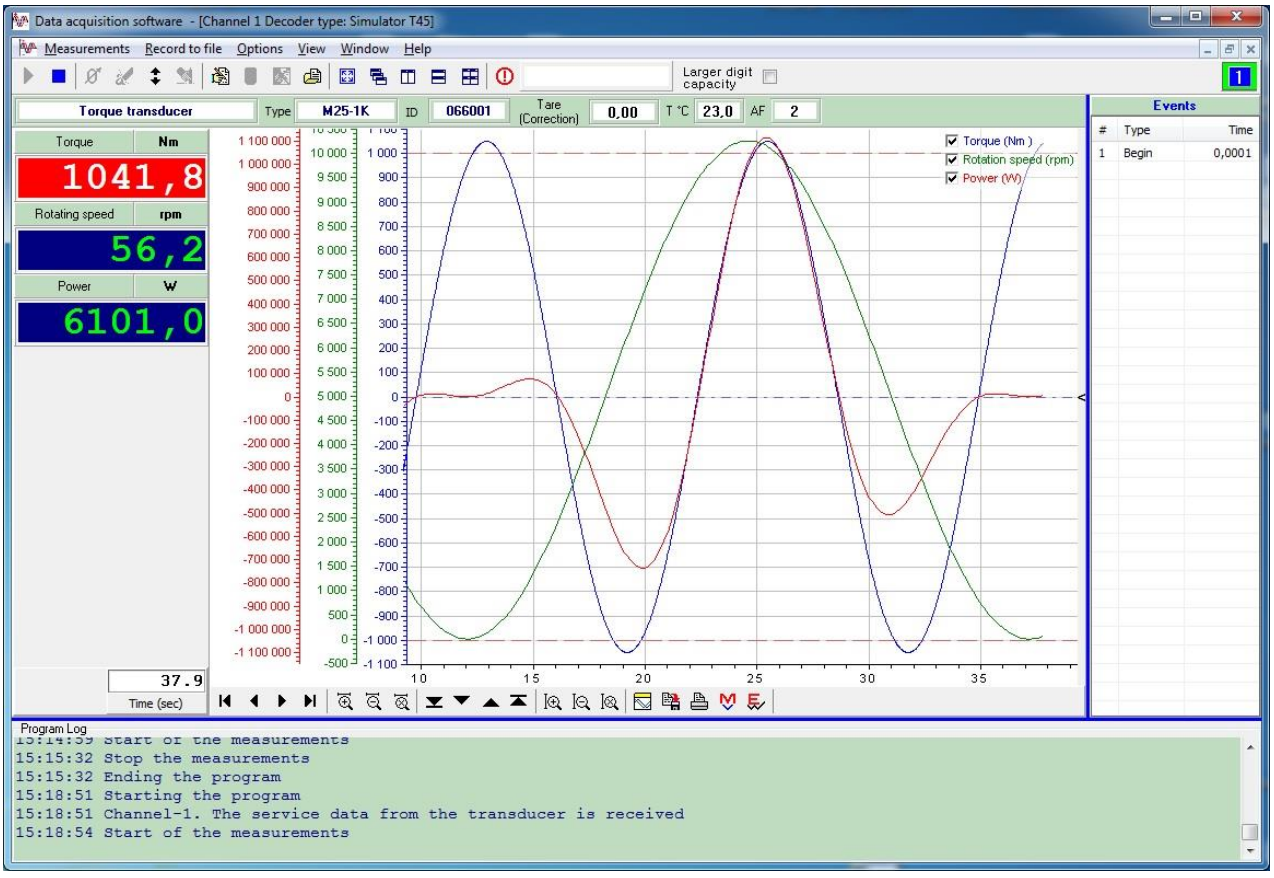
Frequency decoder T23 Dimensions (in mm)



Pin	Pin assignment
1	Torque
2	Speed
3	GND

Software

The “Transducer” software for MS Windows 10, 7, XP® provides the visualization and data acquisition on a PC via the USB 2.0 interface.



The M25 Torque Transducers are supplied with decoders made as separate modules connected to the Transducer with a signal cable. Decoders are available with digital (USB2.0, RS232, RS485, Ethernet, CAN), analog (±5B, ±10B, 4 ... 20mA) and frequency (10kHz±5kHz, 60kHz±30kHz) outputs. Digital decoders can be connected to a computer for monitoring the measurement process and data acquisition. Software for Windows included.

Standard scope of delivery

Torque Transducer M25-*XX* [1]	1
Decoder TYY [2]	1
Output signal cable 5m length	1
Power supply connector (2PM14 or PC4TB)	1
Software “Transducer” for MS Windows	1
Software user manual	1
Operating manual for M25 Torque Transducer	1

1) *XX* – nominal torque
2) *YY* – type of decoder

Accessories (to be ordered separately)

	Disc couplings of the MB series - to compensate for angular, axial and radial displacement of shafts when installing The Transducer.
	The T40 display unit is used to display the values of torque, force, rotational speed and power measured by the M type torque transducers and CT force transducers.
	The T42 display unit is designed to indicate torque, force, rotational speed and power measurement values made with the M type torque transducers and the CT type force transducers. The T42 display unit can include optionally: USB2.0, RS232, RS485, CAN, Ethernet interfaces; Analogue or Frequency output; Two-level relay to control an external actuator.
	The T50 display unit is used to monitor the torque value from a distance of up to 50-70m.
	Decoders: T23 Frequency output, T24 Analogue output, T42 RS 232, T45 USB 2.0, T46 RS 485
	Power adapter 12 ... 30 V
	Signal cable of any length (up to 200 m).

Transducers may be subject to changes on delivery that are not specified in this data sheet.

According to the customer's technical assignment, non-standard products with the required parameters can be designed and manufactured.

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