MA20B Torque Transducer

The MA20B is non-rotating torque transducer with the mixed connecting ends. It has a flange end at the one side and a square at the other side. The square end is produced according to ISO 1174-2.

The MA20B transducer measures torque within the range of nominal values from 5 up to 1 000 Nm.

MA20B series transducers are digital transducers, where SG signal is converted into digital code and is transmitted from the rotor to the stator by means of contactless telemetry.

The digital coded signal has high interference immunity, provides high accuracy of measurements and can be transmitted over significant distances without distortion and loss of information.

The MA20B measure static and dynamic (rapidly changing) torque with positive and negative polarity.

The MA20B torque transducers can have different output signals: digital (USB 2.0, RS232, RS485 (Modbus RTU protocol) interfaces), analogue (± 5 V, ± 10 V, 4 … 20 mA) and frequency (10 kHz ± 5 kHz, 60 kHz ± 30 kHz). The MA20B can be connected to a PC to monitor the measurement process and to save the data. The appropriate software is in the scope of supply.

Type-Survey

Type	Nominal toque M_N, Nm	Connecting square ISO 1174-2
MA20B-5 … 20	5 10 12 15 20	F10
MA20B-30 … 100	30 40 50 60 80 100	F12.5
MA20B-120 … 200	120 150 200	F1.5
MA20B-300 … 500	300 400 500	F20
MA20B-600 … 1k	600 800 1 000	F25

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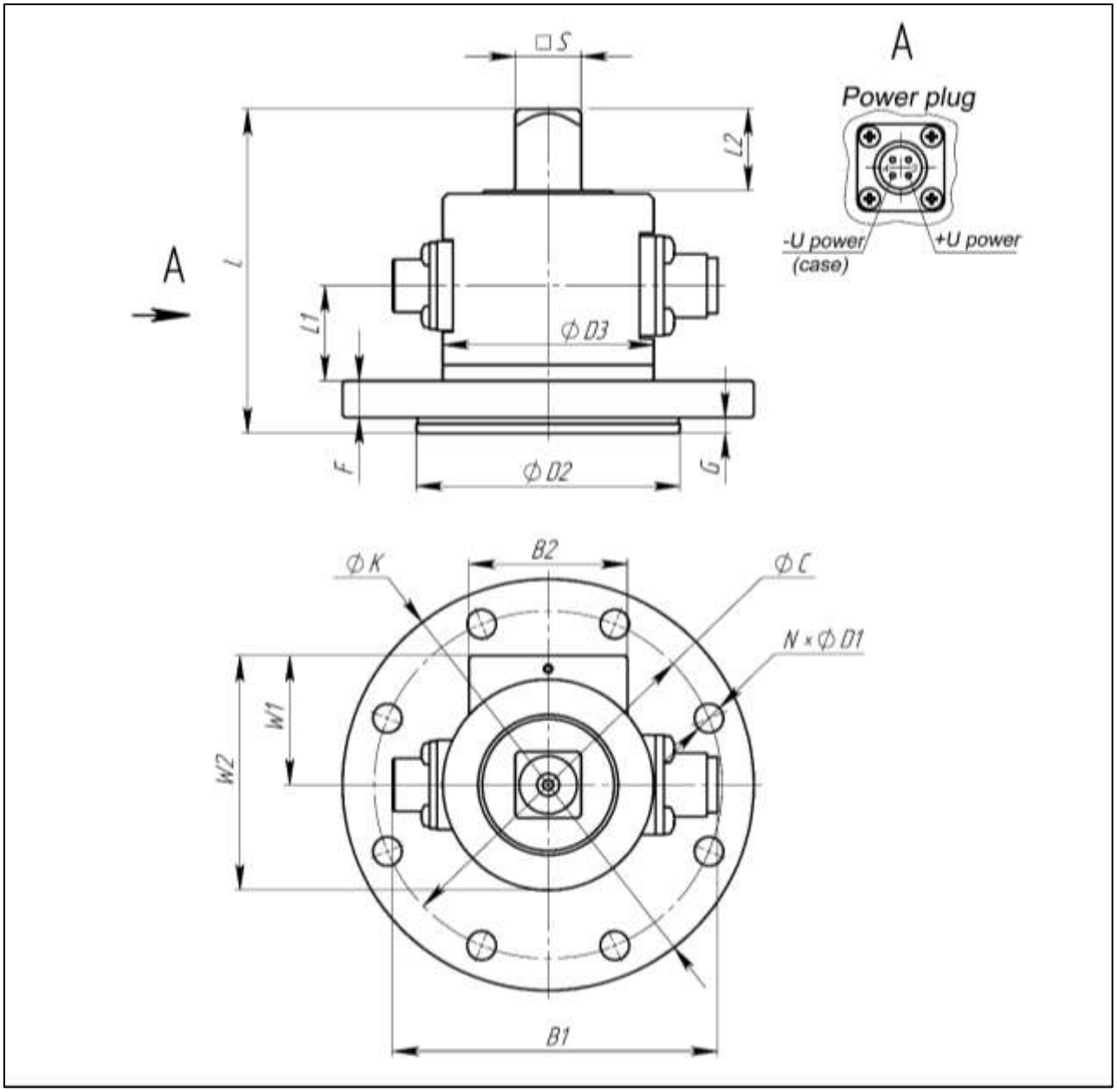
MA20B. Dimensions in mm



Type	B1	B2	W1	W2	L	L1	ØK	ØD3
MA20B-5 … 20	62	30	24.5	44.5	56.0	18	78	40
MA20B-30 … 100	62	30	24.5	44.5	61.5	18	78	40
MA20B-120 … 200	69	30	27.0	50.0	61.5	18	90	46
MA20B-300 … 500	83	30	34.0	64.0	79.0	21	122	60
MA20B-600 … 1k	83	30	34.0	64.0	84.0	21	122	60

Type	Connecting square		L2	N	ØD1	ØC	F	ØD2	G
	ISO 1174-2	□S							
MA20B-5 … 20	F10	$9.53_{-0.07}$	11,0	8	5.5H12	66	7	Ø50g6	3.0
MA20B-30 … 100	F12.5	$12.7_{-0.07}$	15,5	8	5.5H12	66	7	Ø50g6	3.0
MA20B-120 … 200	F12.5	$12.7_{-0.07}$	15,5	8	6.6H12	76	7	Ø60g6	3.0
MA20B-300 … 500	F20	$19.05_{-0.08}$	23,0	12	9H12	104	12	Ø80g6	3.0
MA20B-600 … 1k	F25	$25.4_{-0.08}$	28,0	12	9H12	104	12	Ø80g6	30

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Technical data

1. For **Nominal torque** and connecting square dimensions see table «Type-Survey»

2. Electrical and metrology parameters

Deviation of the actual output signal at the nominal torque from the nominal value (including hysteresis and nonlinearity)	%	± 0.2
Temperature effect per 10 °C on the zero signal, related to the nominal output value	%	± 0.1
Nominal supply voltage	V (DC)	12 … 30
Power consumption	W	< 5
Measurement frequency range	Hz	0 …1 000 (- 1.5 dB)
Amplitude ripple (0 … 500 Hz)	dB	≤ 0.1
Frequency output (T23 decoder)		
Frequency output signal with positive nominal torque	kHz	15 (90)
Frequency output signal with negative nominal torque	kHz	5 (30)
Frequency output signal at torque = zero	kHz	10 (60)
Load resistance	kΩ	≥ 2
Output voltage	V	5 ± 1 (symmetrical meander)
Input-output galvanic isolation		+
Analogue output (T24 decoder)		
Nominal output signal with positive (right-hand) nominal torque	V	+ 5 (+ 10)
Nominal output signal with negative (left-hand) nominal torque	V	- 5 (- 10)
Output signal at torque = zero	V	0
Load resistance	kΩ	≥ 10
Analogue output (T24/4 … 20 mA decoder)		
Output current	mA	4…20
Output current at loading = zero	mA	12
Output current at nominal positive loading	mA	20
Output current at nominal negative loading	mA	4
Load resistance	kΩ	≥ 100
Digital output (T45 decoder)		
Interface		USB 2.0
Data transfer rate (Full-Speed)	Mbit/sec	12
Sample rate	kSample	5.0
Input-output galvanic isolation		+
Digital output (T37 decoder)		
Interface		Ethernet
Data transfer rate	Mbit/sec	10; 100
Sample rate	kSample	5.0
Input-output galvanic isolation		+
Digital output (T46 decoder)		
Interface		RS485
Protocol		MODBUS RTU
Data transfer rate	baud	2 400 - 115 200
Parity check		+
Sample rate	kSample	5.0
Input-output galvanic isolation		+
Digital output (T42 decoder)		
Interface		RS232
Data transfer rate	baud	2 400 - 115 200
Parity check		+
Sample rate	kSample	5.0
Input-output galvanic isolation		+

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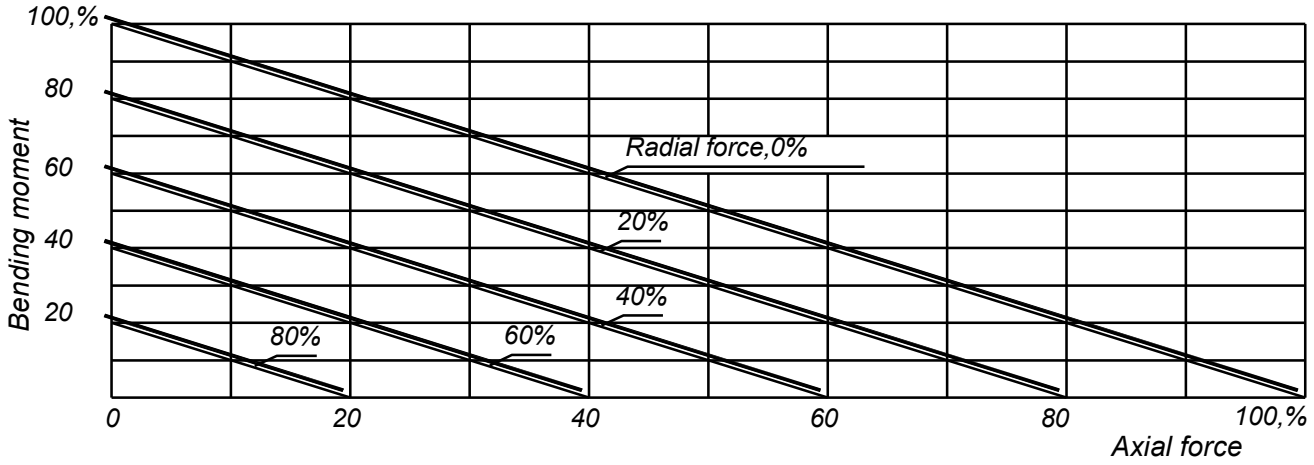
3. Parameters of resistance to environment and mechanical exposures

Nominal temperature range	°C	0 … + 60
Relative humidity	%	≤ 95 (+ 35 °C)
Air 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	 1 000 10 400
Degree of protection		IP40

4. Limit torque, related to M_N

Type	Nominal Torque M_N, Nm	Limit torque related to M_N, %
MA20B-5 … 20	5 10 12 15 20	150
MA20B-30 … 100	30 40 50 60 80 100	
MA20B-120 … 200	120 150 200	
MA20B-300 … 500	300 400 500	
MA20B-600 … 1k	600 800 1 000	

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



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Scope of delivery

MA20B torque transducer	1
Txx decoder	1
Output signal cable 5 m long (optionally can be over in length)	1
Power supply connector PC4	1
“Transducer” software for Windows XP, 7, 8, 10 OS	1
Software user manual	1
Operating manual	1

Accessories (to be ordered separately and optionally)

T40 display unit	1
T41 display unit (plastic case)	1
T50 display unit	1
T24 analogue decoder (± 5 V, ± 10 V or 4… 20 mA)	1
T23 frequency decoder (10 ± 5 kHz or 60 ± 30 kHz)	1
T45 digital decoder (USB 2.0)	1
T42 digital decoder (RS232)	1
T46 digital decoder (RS485)	1
T37 digital decoder (Ethernet)	1
AC/DC adapter (12 … 30 V)	1

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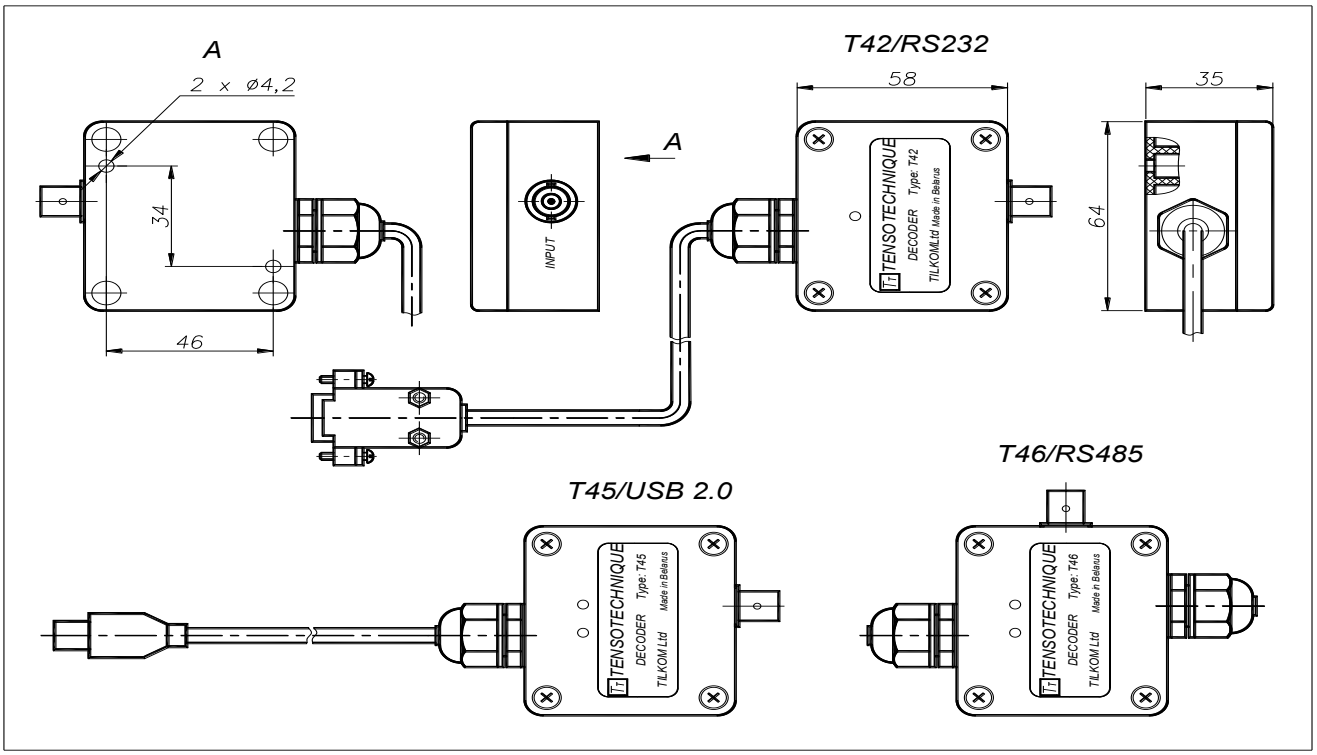
T42, T45, T46 digital decoder. Dimension in mm



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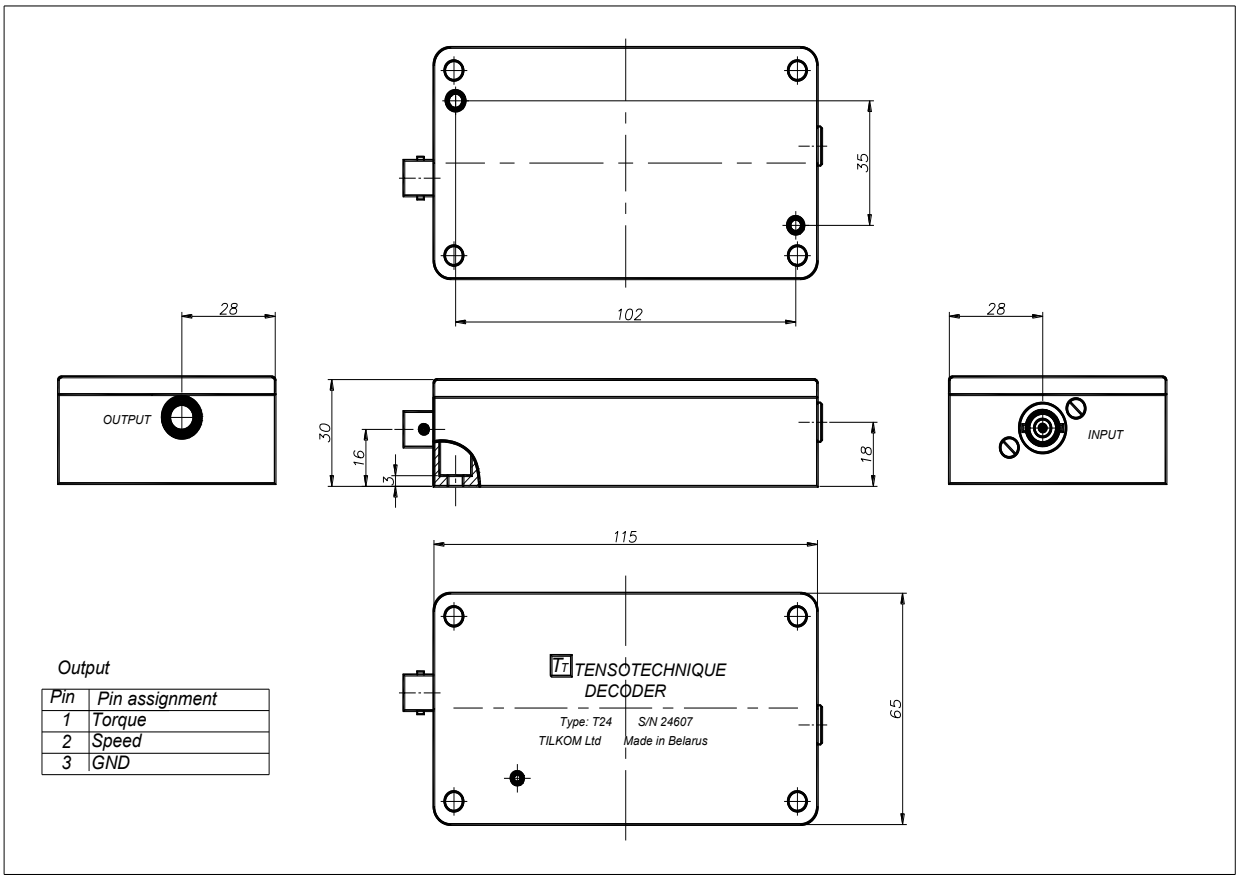
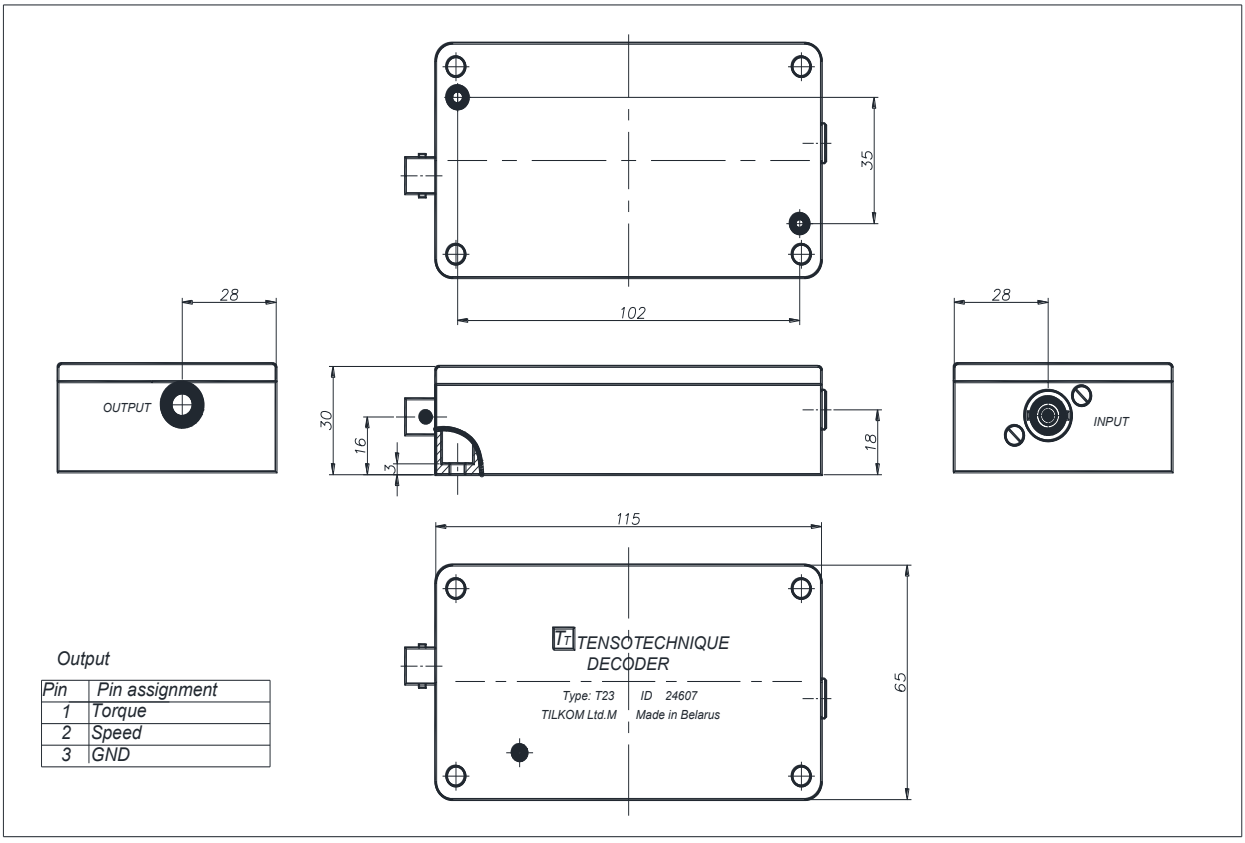
T24 analogue decoder. Dimension in mm



Output

Pin	Pin assignment
1	Torque
2	Speed
3	GND

T23 frequency decoder. Dimensions in mm.



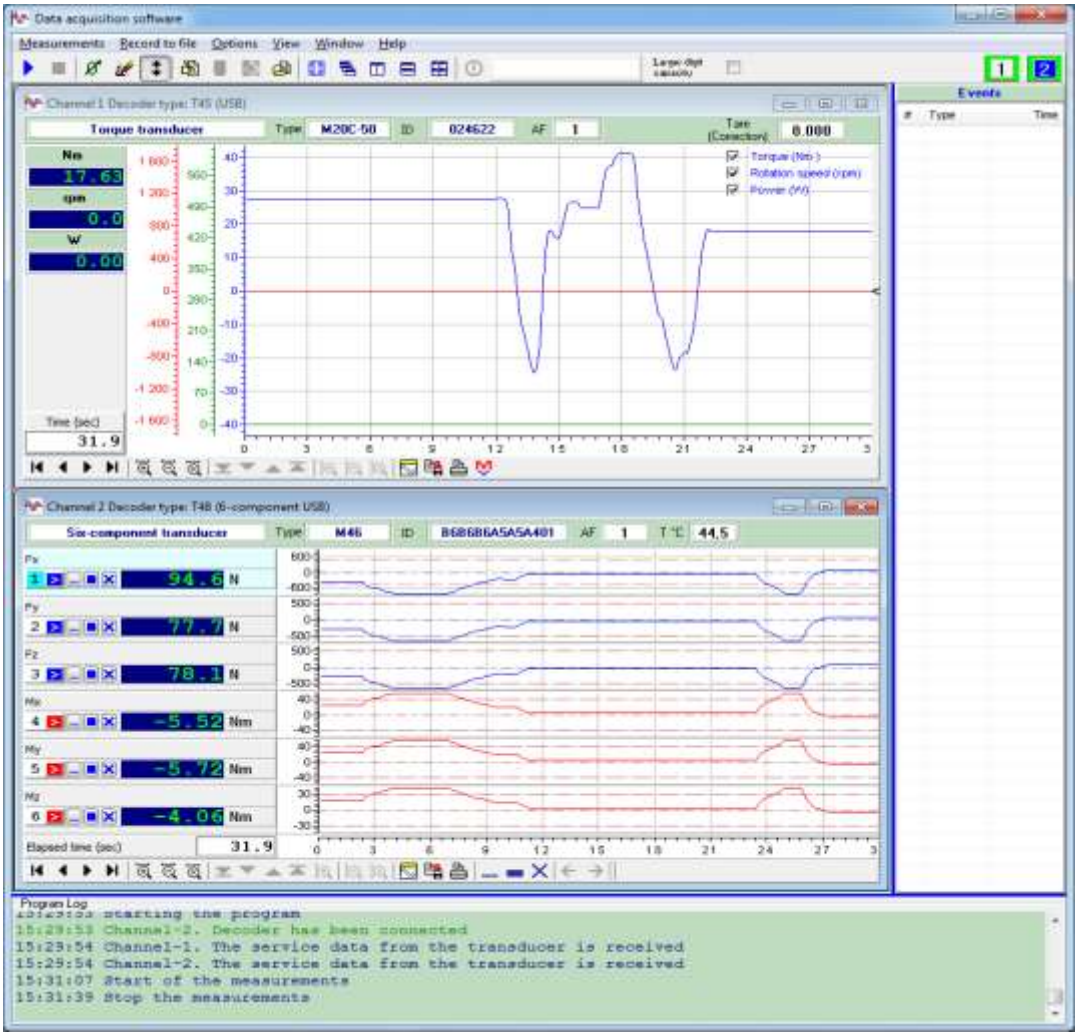
Output

Pin	Pin assignment
1	Torque
2	Speed
3	GND

Software

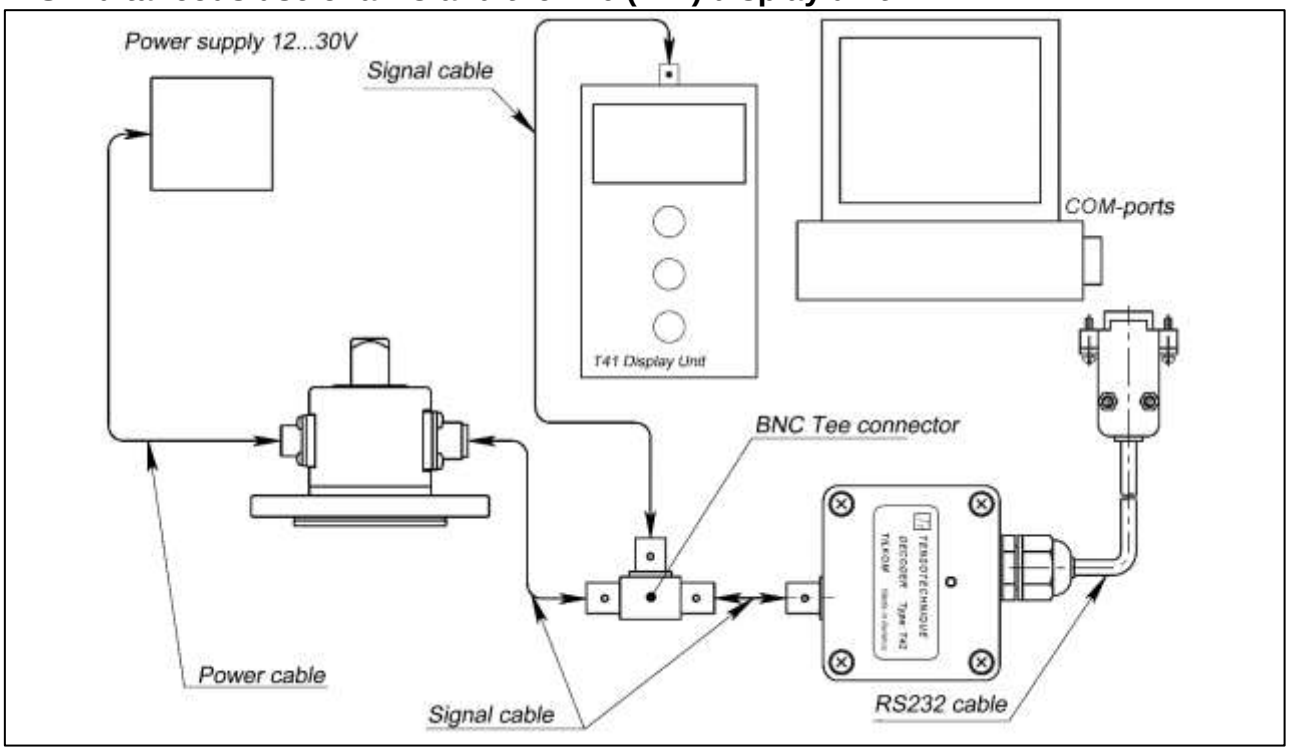
The Microsoft® Windows-based software for MA20B torque transducer enables the acquisition of measurement data and its storage in a file. The measurements can be visualized on-line with digital indicators and x/y displays. A text file is provided for storage so that the measurement data can be read and processed by other programs.
The software provides auto identification of type of transducer, serial number, measuring range.
Features: support up to 8 (eight) transducers simultaneously, mathematical computation of mechanical power, rotation speed and torque, measurement signal filter and signal averaging, zero shift adjustment, fast records, slow records, scaling of x-axis and y-axis, digital indicator of high resolution, real-time display of measured values, their storage and playback. The software has a function of recording data without averaging at the maximum speed of receiving data; this enables you to analyze the dynamic processes.

The main window of the “Transducer” software

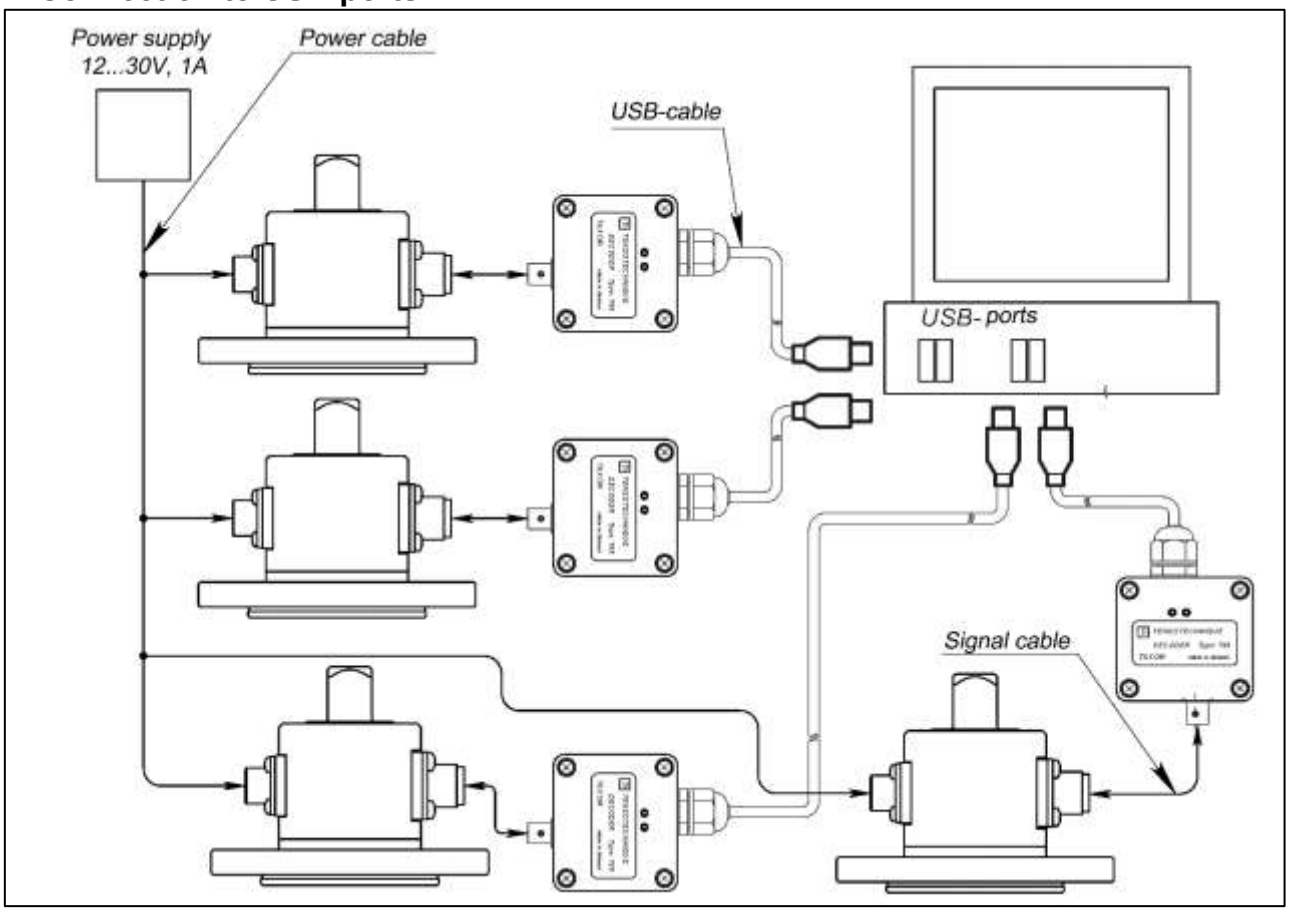


Electrical connections

1. Simultaneous use of a PC and the T40 (T41) display unit



2. Connection to USB-ports



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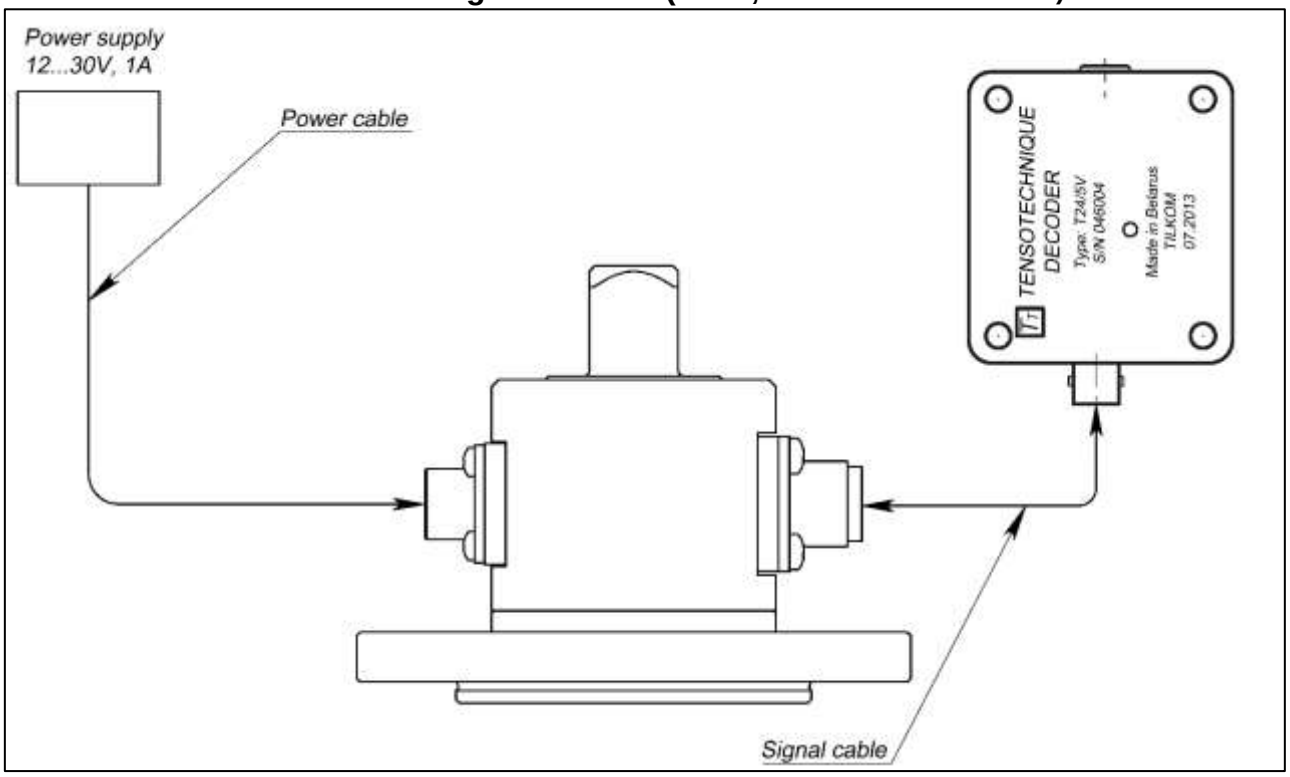
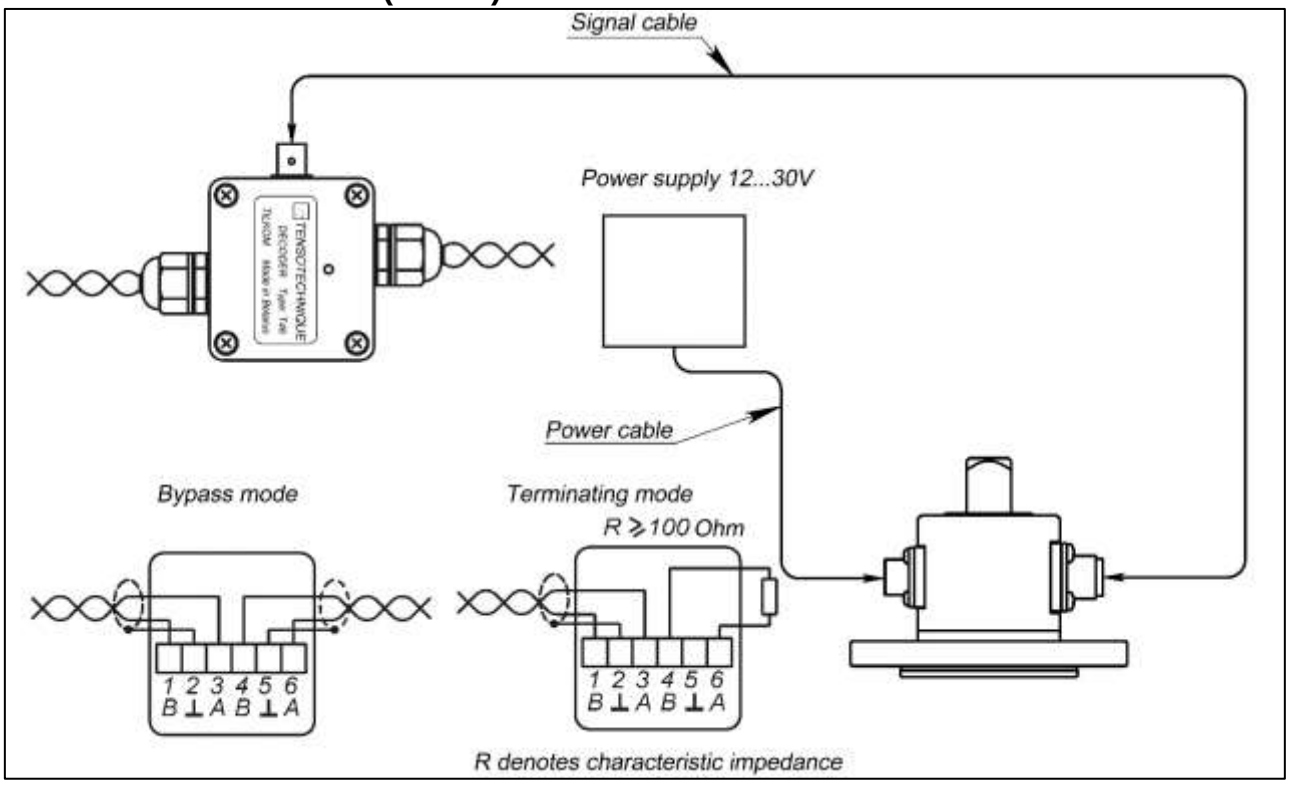
3. Connection to the T24 analogue decoder (± 5 V, ± 10 V or 4…20 mA)



4. Connection to the T46 (RS485) decoder



5. Connection to the T40 display unit