

M40A Torque Transducer



M40A torque transducers have mixed mounting connections. The rotor of the M40A has a smooth cylindrical shaft at the one end and a flange at another end.

The M40A transducers are used to measure static and dynamic torque at the measuring range $\pm 5 - \pm 2\,000$ Nm and the high rotation speed up to 20 000 rpm.

There are no slip rings in the construction. The rotor and the stator of the M40A do not have mechanical contact. The M40A transducers are the generation of digital transducers, where the SG signal is converted into digital code and is transferred from the rotor to the stator by means of telemetry.

This 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.

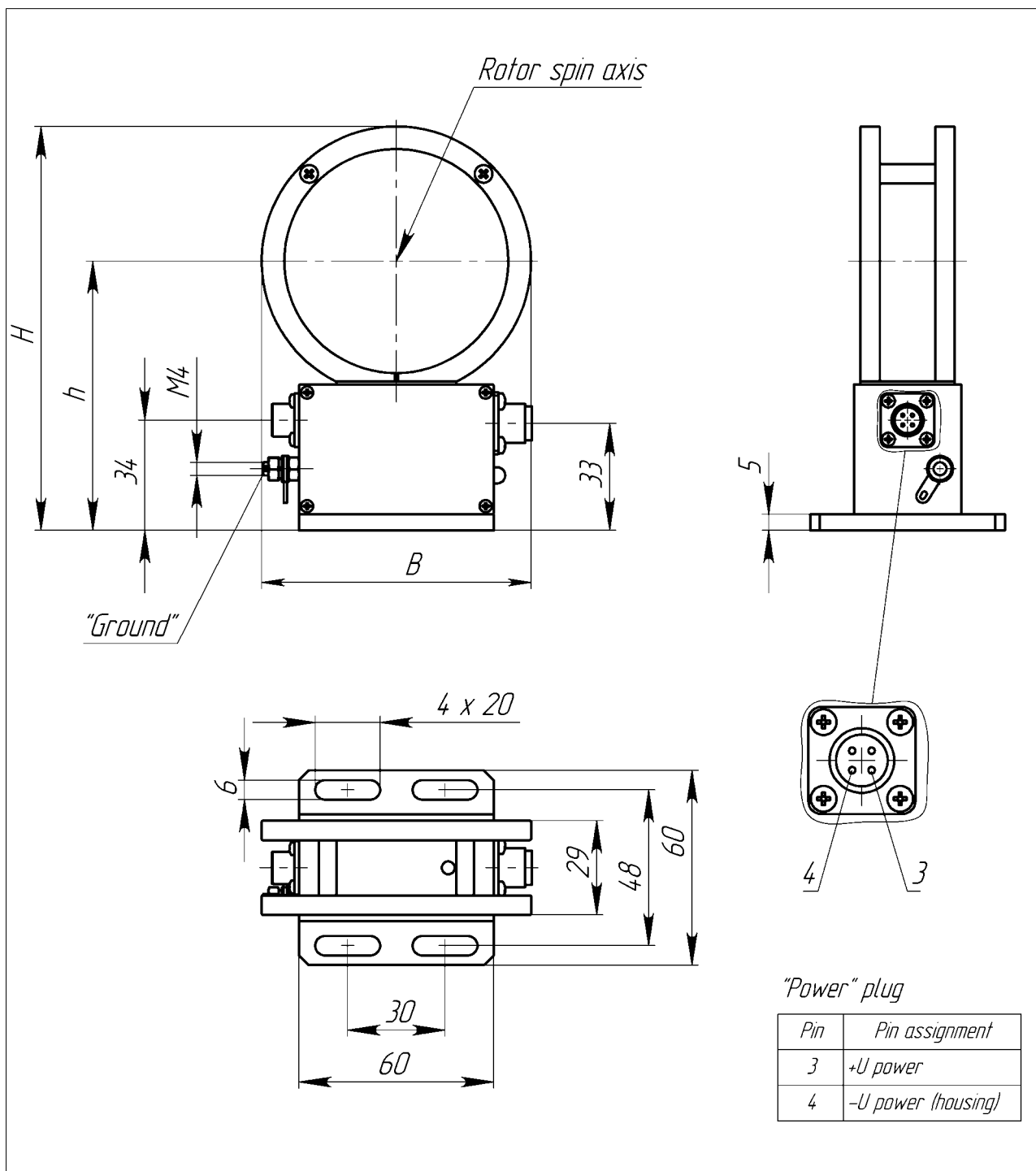
M40A torque transducers are suitable to determine static as well dynamic rapidly changing torque in positive and negative polarity. The transducers have a built-in optoelectronic speed sensor.

The M40A torque transducers can provide digital (USB2.0, RS232, RS485 (Modbus protocol)), analogue (± 5 V, ± 10 V, 4 ... 20 mA) and frequency (10 ± 5 kHz, 60 ± 30 kHz) output signals according to the custom requirements. They can be directly connected to a PC to monitor the measuring process and to save data. The special software is in the scope of supply.

Type-Survey

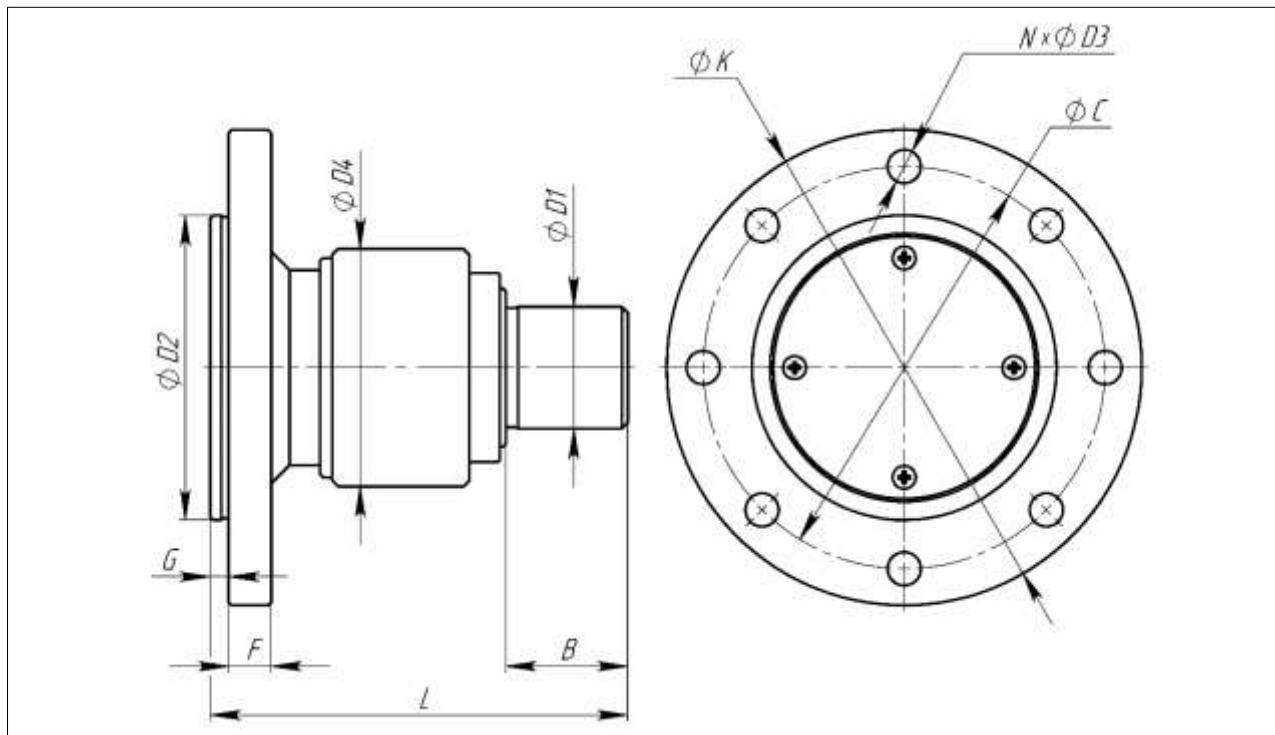
Type	Nominal torque M_N , Nm	Max. speed, rpm
M40A-0.1 ... 2	0.1 0.2 0.3 0.5 1 2	40 000
M40A-5 ... 30	5 10 12 15 20 25 30	40 000
M40A-40 ... 120	40 50 60 80 100 120	32 000
M40A-150 ... 300	150 200 250 300	32 000
M40A-400 ... 1k	400 500 600 800 1 000	24 000
M40A-1.2k ... 2k	1 200 1500 2 000	24 000

Stator M40A. Dimensions in mm



Type	h	H	B
M40A-0.1 ... 2	67.0	93.0	80.1
M40A-5 ... 30	67.0	93.0	80.1
M40A-40 ... 120	70.5	99.5	80.1
M40A-150 ... 300	73.0	104.0	80.1
M40A-400 ... 1k	83.0	124.5	83.2
M40A-1.2k ... 2k	87.5	134.0	93.0

Rptor M40A. Dimensions in mm



Type	B	ØD1	ØC	ØD3	N	F	ØD2	G	ØD4	L	ØK
M40A-0,1 ... 2	15.0	Ø10g6	38	3.4	4	4	Ø30g6	2.5	35	69	45
M40A-5 ... 30	20.0	Ø15g6	50	4.5	8	5.5	Ø40g6	2.5	35	77.0	60
M40A-40 ... 120	20.0	Ø20g6	66	5.5	8	7.0	Ø50g6	3.0	40	78.0	78
M40A-150 ... 300	23.0	Ø24g6	76	6.4	8	7.0	Ø60g6	3.0	45	81.0	90
M40A-400 ... 1k	33.5	Ø40g6	104	8.5	12	12.0	Ø80g6	3.0	64	96.5	122
M40A-1.2k ... 2k	35.0	Ø50g6	120	10.5	12	14.0	Ø90g6	3.0	74	100.0	142

Technical data

Nominal torque M_N and max. speed see table «Type-Survey».

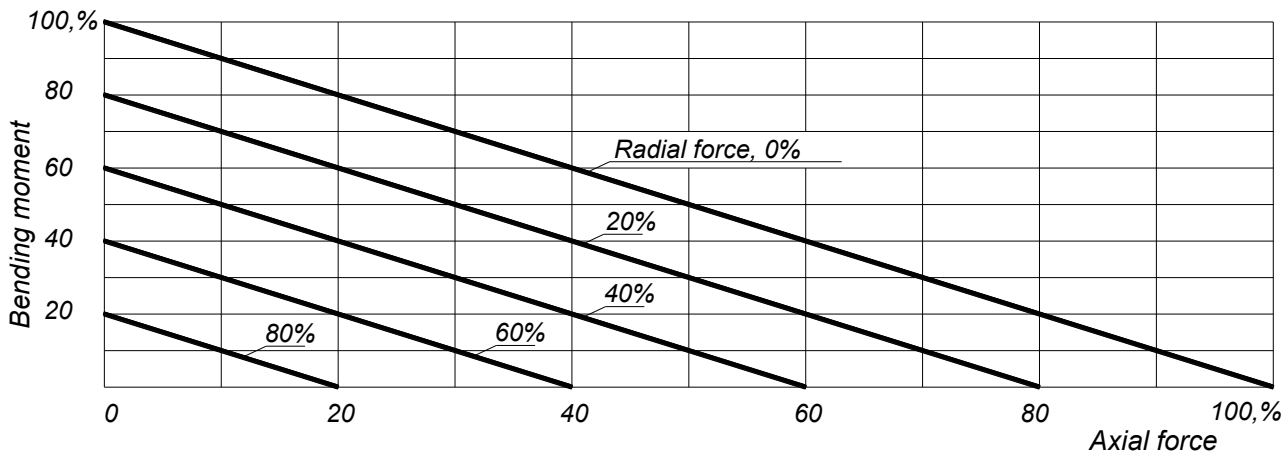
Accuracy class		0.2
Deviation of the actual output signal at the nominal torque from the nominal value (including hysteresis and nonlinearity)	%	± 0.2
Temperature effect per 10 °C on the zero signal, related to the nominal output value	%	± 0.1
Nominal supply voltage	V (DC)	12 ... 30
Power consumption	W	< 5
Measurement frequency range	Hz	0 ... 1000 (- 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	k Ω	≥ 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	k Ω	≥ 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	k Ω	≥ 100
Digital output (T45 decoder)		
Interface		USB 2.0
Data transfer rate (Full-Speed)	Mbit/sec	13
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		+
Rotation speed measuring system		
Accuracy (within 30 ... 20 000 rpm)	%	± 0.1
Pulses per revolution depending on a decoder	T23, T24	1
	T23/3, T24/3	60, 120, 360, 480, 720 (optionally)
Min. detected speed	rpm	30
Amplitude of output pulse voltage with analogue (frequency) output	V	5 ± 1

3. Parameters of resistance to environment and mechanical exposures

Nominal temperature range	°C	+ 5 ... + 50
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	Hz	10 ... 55
Duration	h	1
Acceleration	m/s ²	40
Impact resistance:		
Number of impacts	n	1 000
Duration	ms	10
Acceleration	m/s ²	400
Degree of protection		IP40

4. Limit torque, related to M_N

Type	Nominal torque M _N	Limit torque related to M _N , %
M40A -5 ... 30	5 10 12 15 20 25 30	



Scope of delivery

M40A torque transducer (rotor and stator)	1
Decoder Txx	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	1
Software user manual	1
Operating manual	1

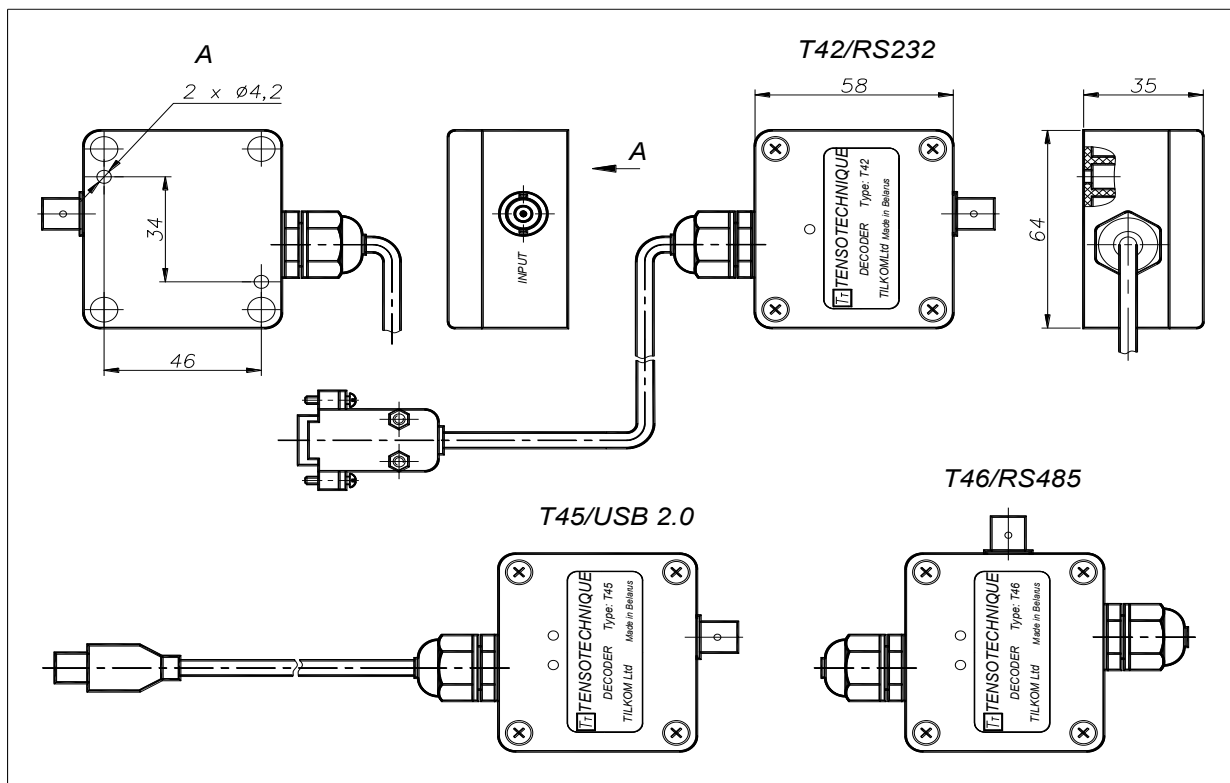
Accessories (to be ordered separately and optionally)

To prevent from excessive stress due to misalignment and thermal influences the transducer should be fitted between flexible couplings. We offer such flexible torsionally rigid couplings MK series from the flange site and MB series from the shaft site.

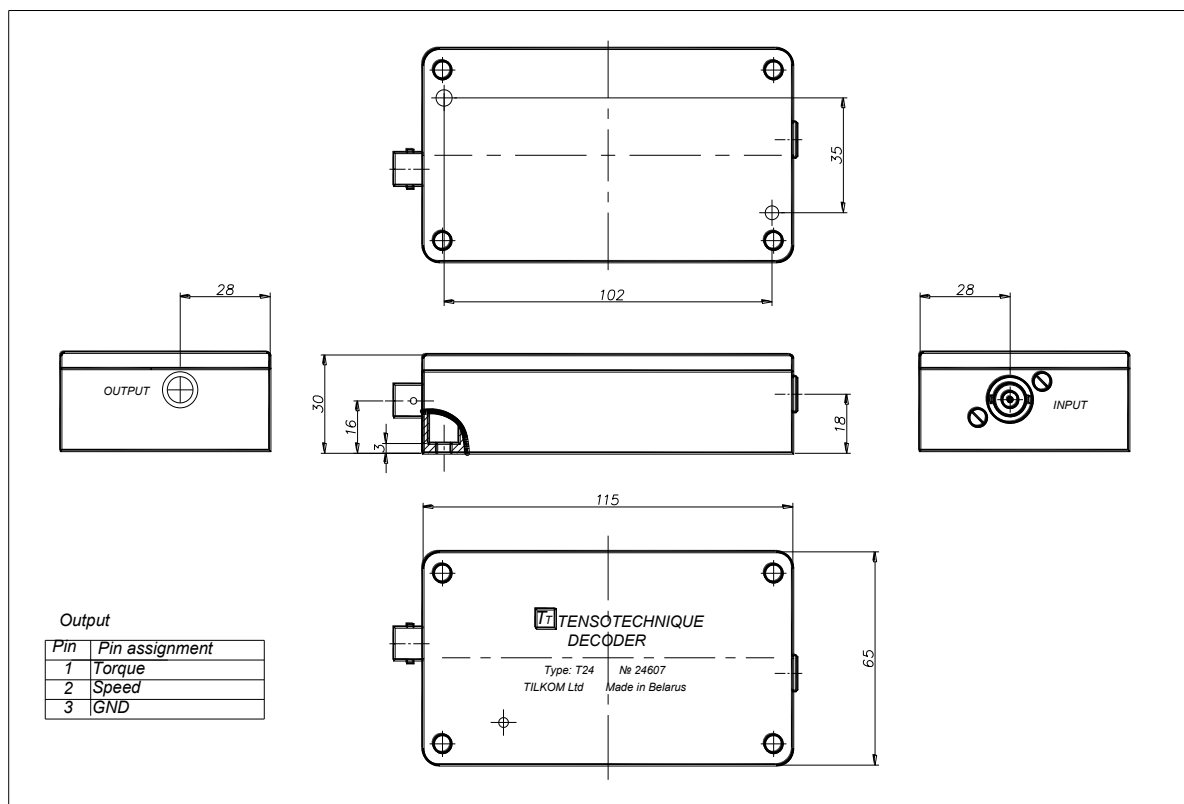


Flexible torsionally rigid couplings MB	1
Flexible torsionally rigid couplings MK	1
T40 display unit	1
T41 display unit (plastic case)	1
T50 display unit (oversize unit for long distances 50 – 70 m)	1
T24 analogue decoder (output ± 5 V; ± 10 V or 4 ... 20 mA)	1
T23 frequency decoder (output 10 kHz \pm 5 kHz or 60 kHz \pm 30 kHz)	1
T45 digital decoder (output USB 2.0)	1
T42 digital decoder (output RS 232)	1
T46 digital decoder (output RS 485)	1
T37 digital decoder (output Ethernet)	1
AC/DC adapter 12 ... 24 V	1

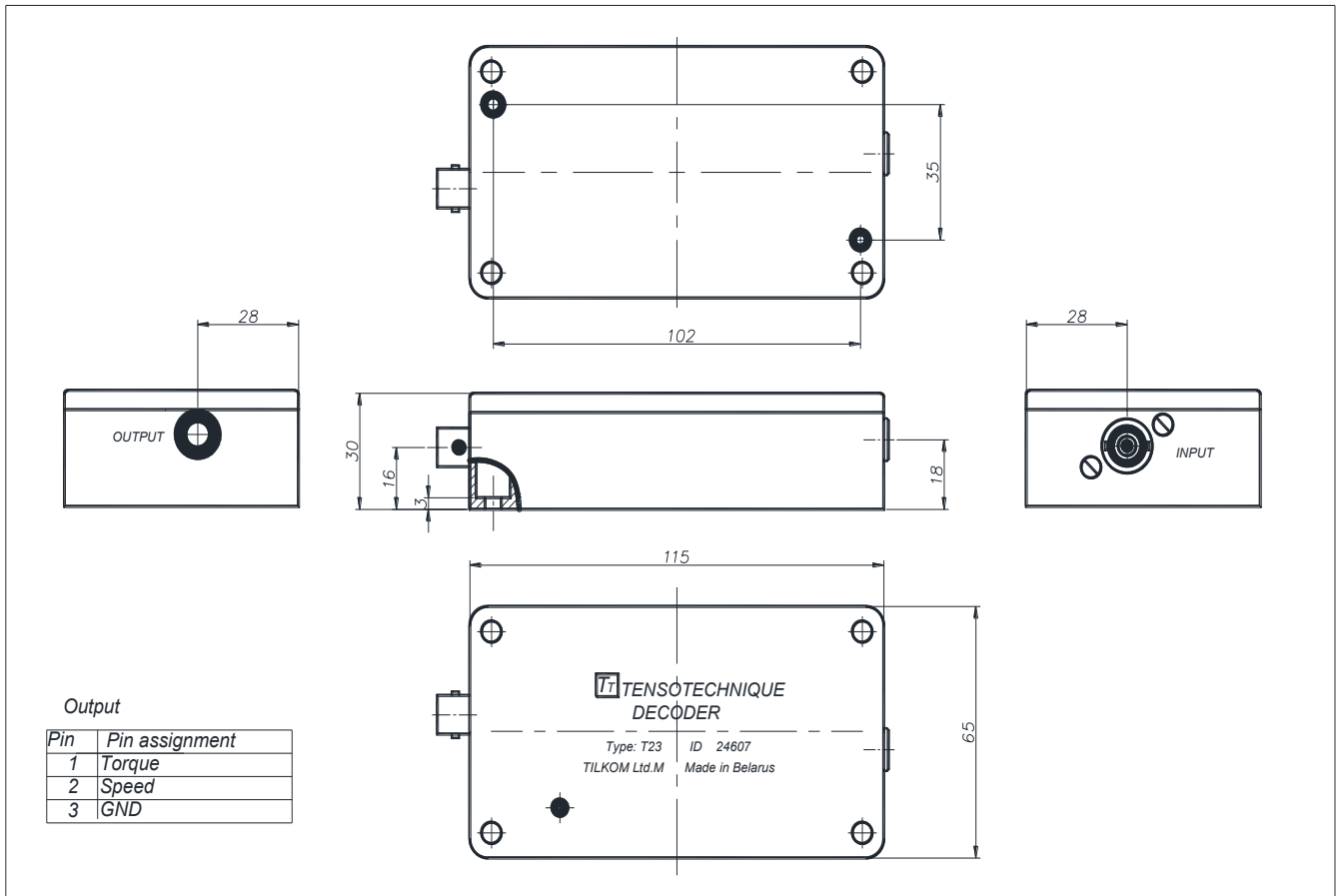
T42, 45, 46 digital decoders. Dimensions in mm



T24 analogue decoder. Dimensions in mm



T23 frequency decoder. Dimensions in mm.

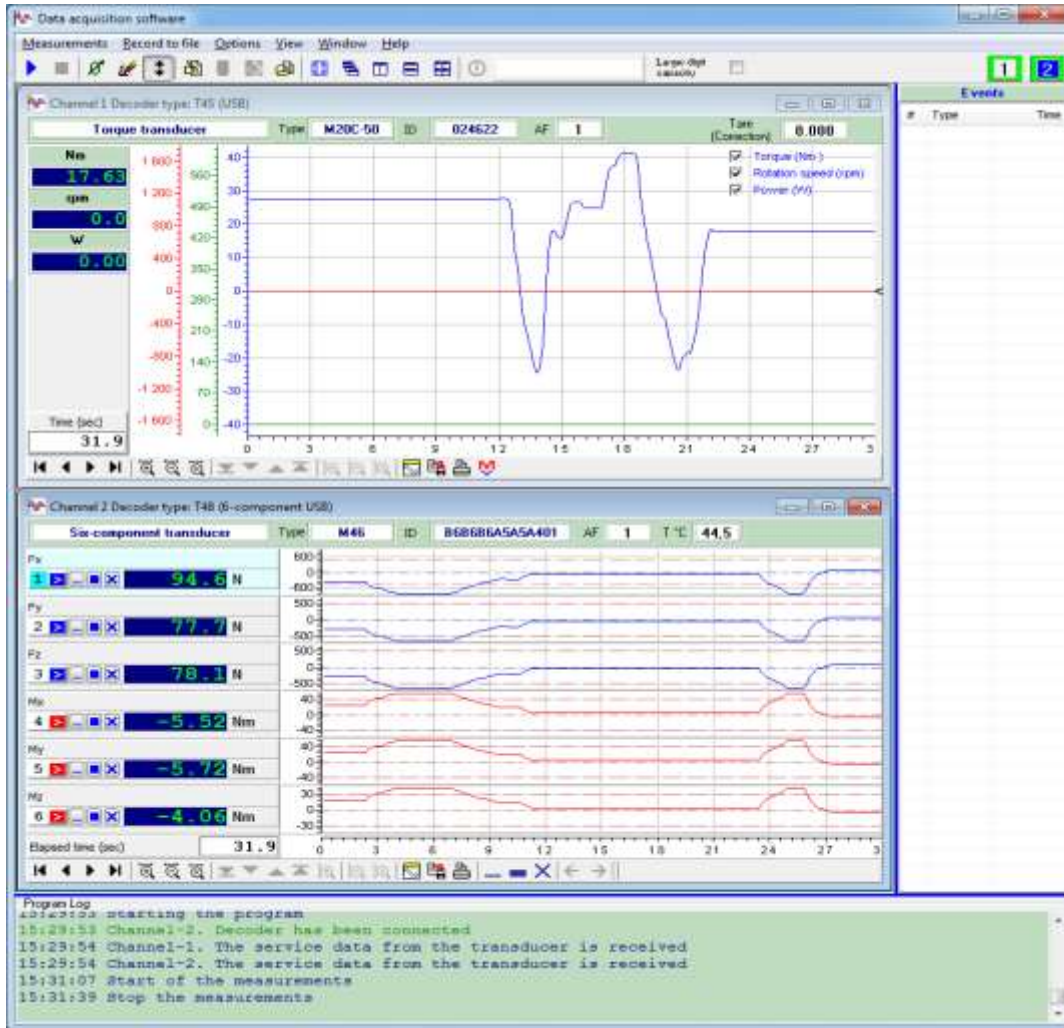


Software

The Windows-based software “Transducer” for M40A 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.

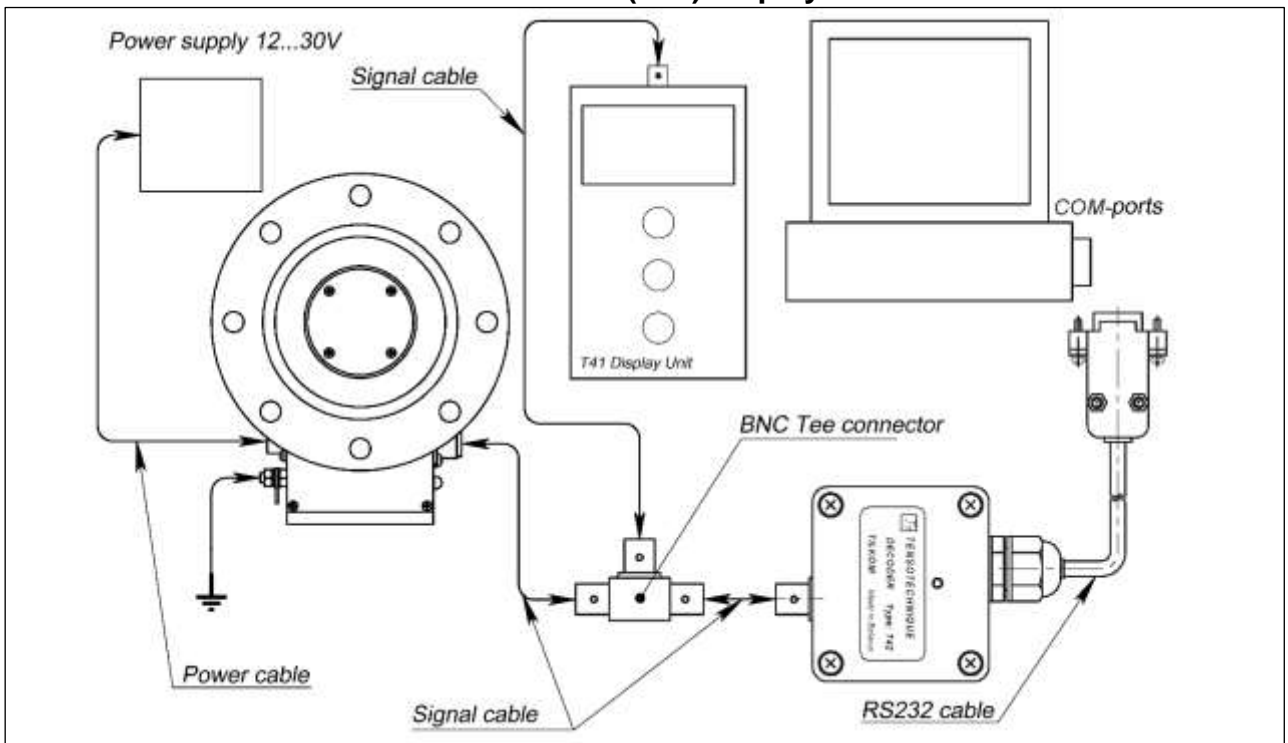
Features: support up to 8 (eight) transducers simultaneously, mathematical computation of mechanical power, rotation speed and torque, measurement signal filter and signal averaging, zero shift adjustment, fast records, slow records, scaling of x-axis and y-axis, digital indicator of high resolution, 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 “Transducer” main window

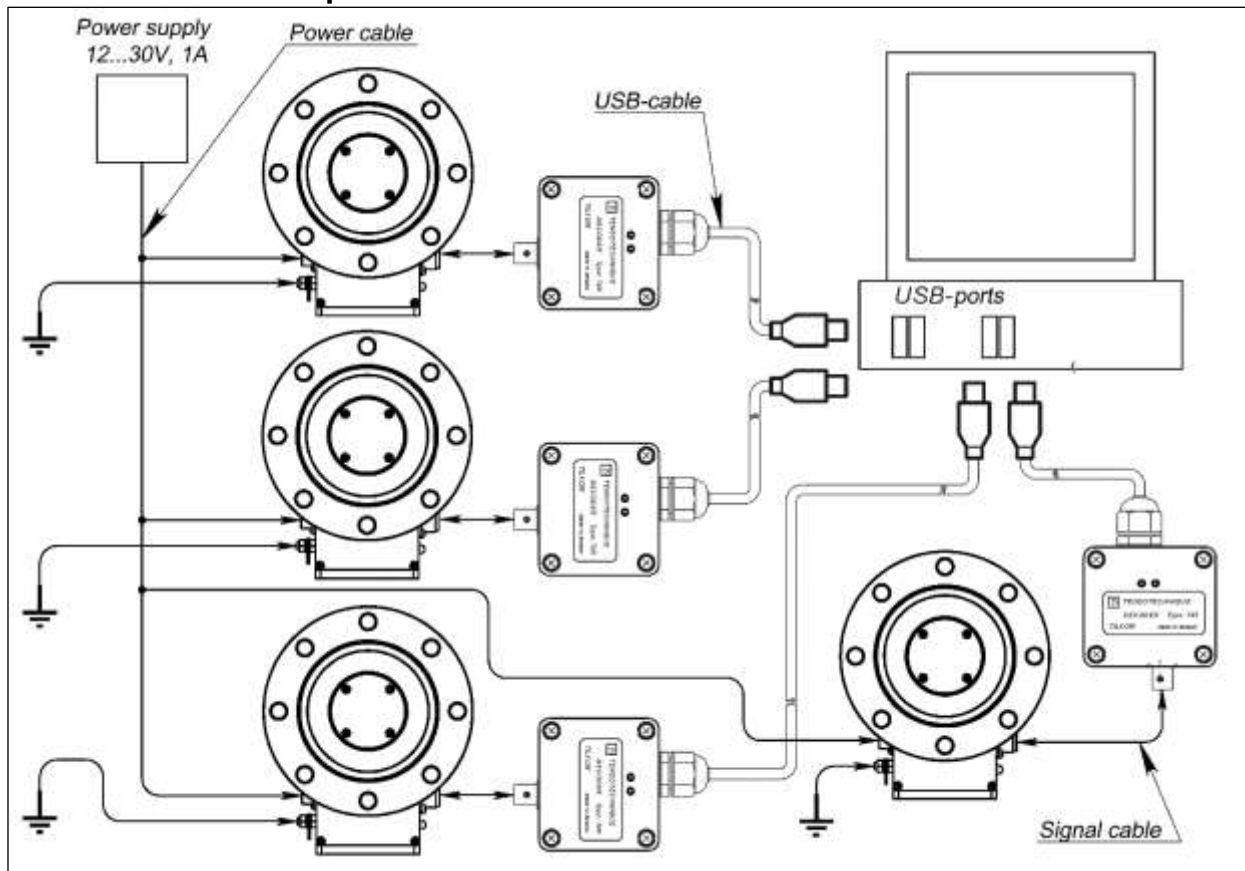


Electrical connections

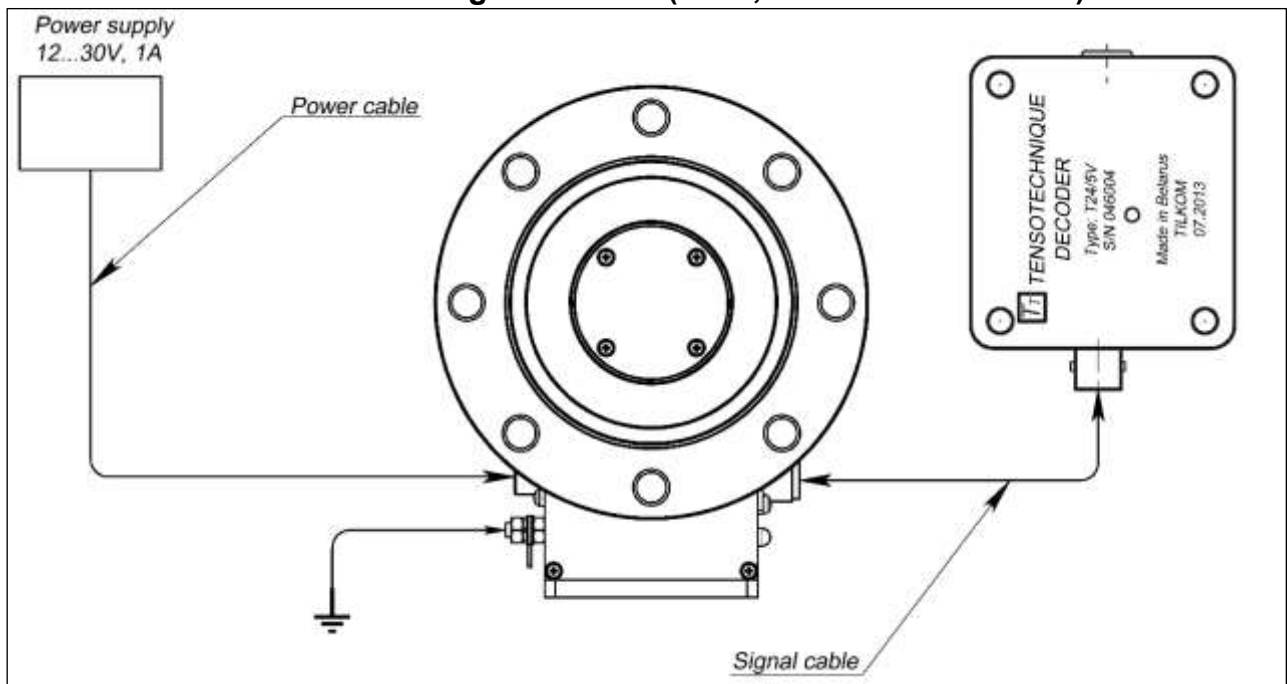
1. Simultaneous use of a PC and the T40 (T41) display unit



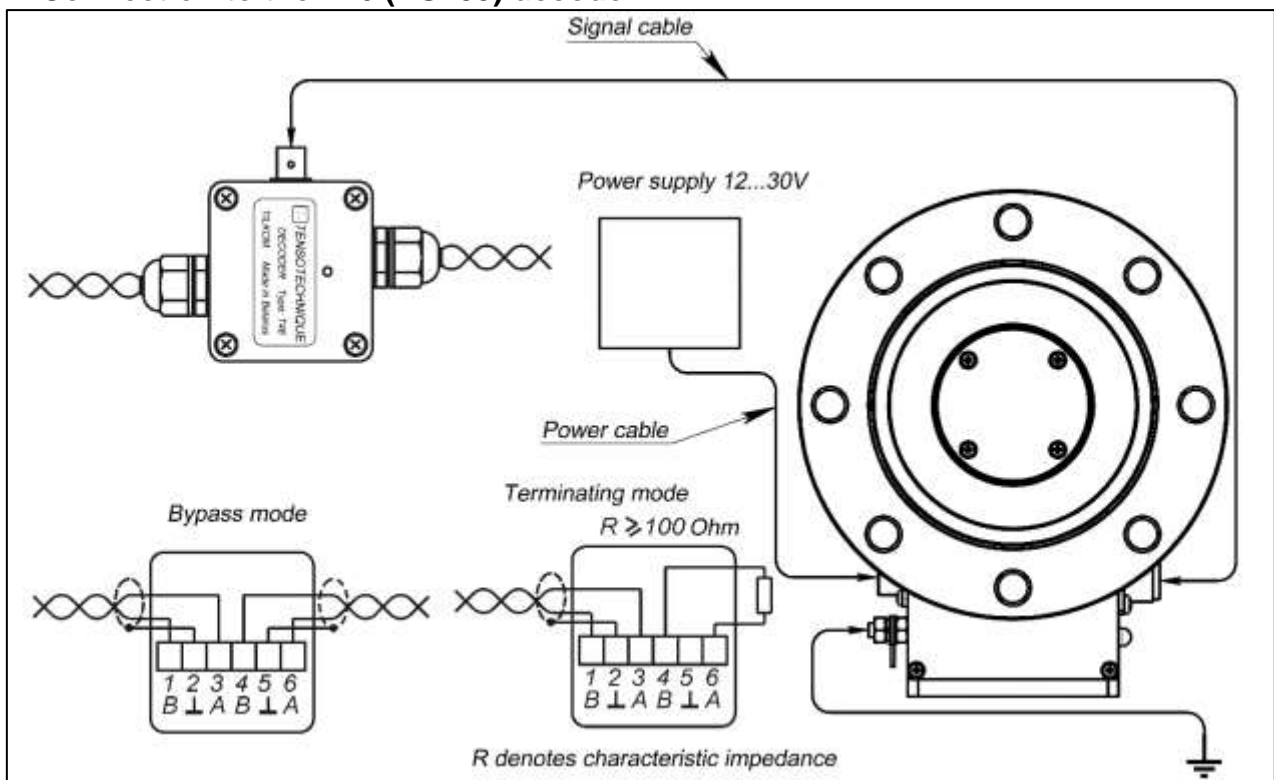
2. Connection to USB-ports



3. Connection to the T24 analogue decoder ($\pm 5\text{ V}$, $\pm 10\text{ V}$ or $4 \dots 20\text{ mA}$)



4. Connection to the T46 (RS485) decoder



5. Connection to the T40 display unit

