Warranty: 24 months

Load Cell and Torque Sensor – X/Y/Z

Configurable up to 3x force / 3x torque

MODEL 8565 NEW

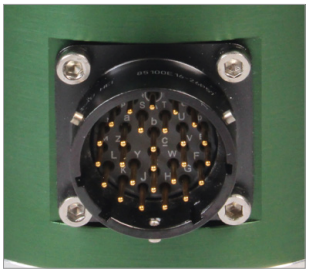
Preliminary data sheet

Highlights

- 6-axis sensor
- Measuring range Fx: 1 kN / Fy: 1 kN / Fz: 2 kN
  Mx: 50 Nm / My: 50 Nm / Mz: 50 Nm
- Other measuring ranges available on request
- Non-linearity < ±0.2 % F.S.
- Excellent price/performance ratio
- Customer-specific axis configuration

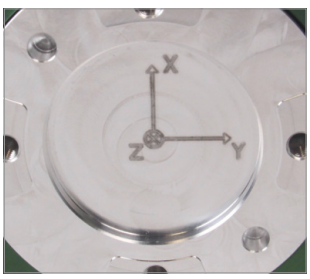
Applications

- Robot-assisted applications
- Pick & place
- Tactile sensing in manufacturing
- Collision detection
- Force-controlled machining



Strain gage output

Robot flange in accordance with DIN ISO 9409-1



Direction of action

Product description

In robotics and automation engineering, the requirements for precise, tactile handling are constantly increasing. The robust 8565 multi-axis sensor with its low crosstalk enables you to monitor and evaluate your process at any time, regardless of the sensor's orientation.

With just one sensor, you can obtain accurate three-dimensional load information. Its six independent outputs let you selectively evaluate the direction of action of the loads (axial force [Fz] / lateral forces [Fx/Fy] / torque [Mz] / bending moment [Mx/My]).

Thanks to its compact design and adaptation via the standardized robot flange in accordance with DIN ISO 9409-1, the sensor can be integrated into many applications quickly and easily.

When the slightest deviations are detected in your fast-moving and complex production processes, you can intervene immediately to make adjustments. This helps to prevent faulty parts and reduce manufacturing costs.

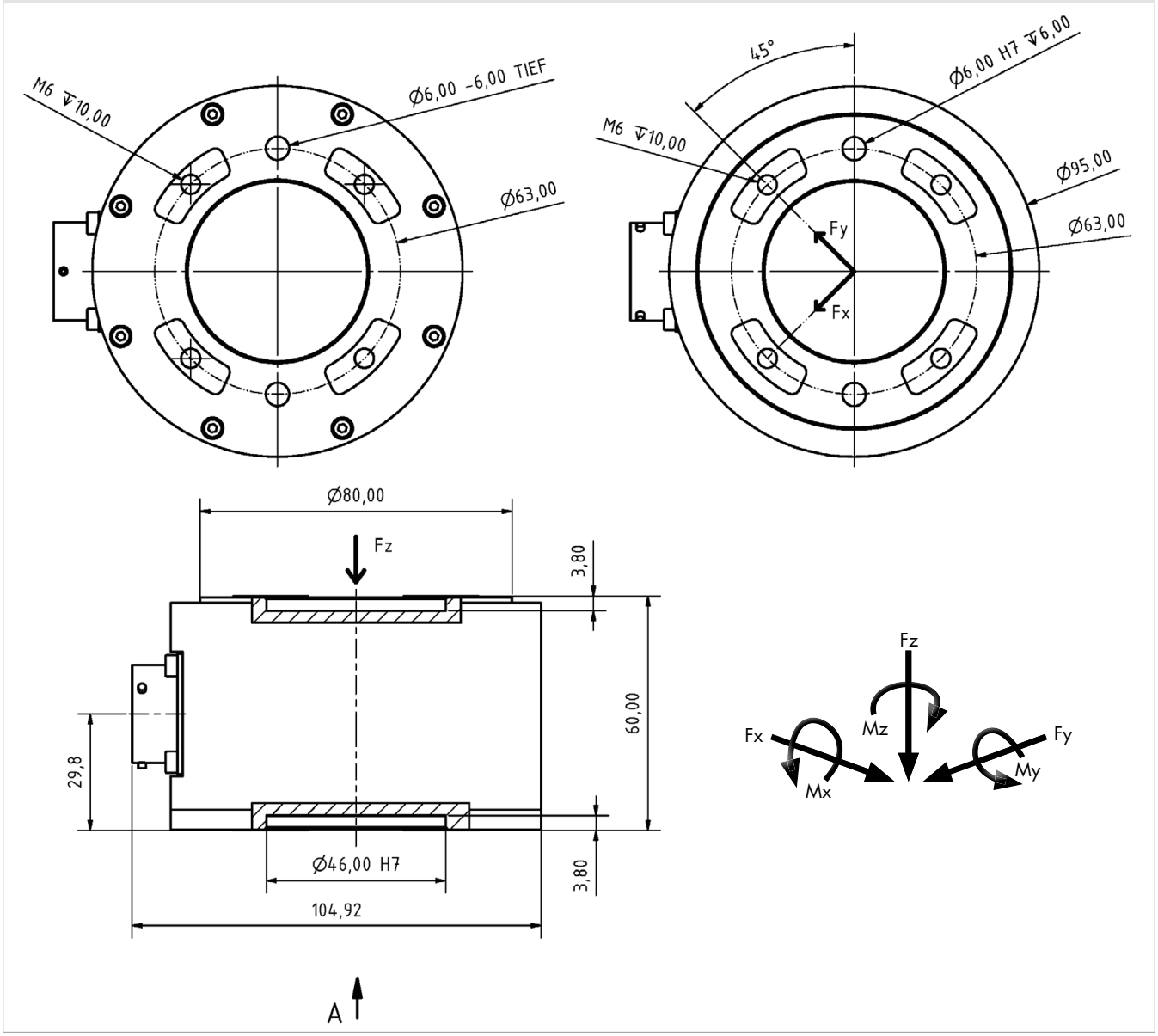
Technical data

8565	–	60025050
Measuring range Fx calibrated in N from 0 ...		Fx = 0 ... ±1 kN (0 ... ±224.8 lbs)
Measuring range Fy calibrated in N from 0 ...		Fy = 0 ... ±1 kN (0 ... ±224.8 lbs)
Measuring range Fz calibrated in N from 0 ...		Fz = 0 ... ±2 kN (0 ... ±449.6 lbs)
Measuring range Mx calibrated in Nm from 0 ...		Mx = 0 ... ±50 Nm (0 ... ±442.51 lbs in)
Measuring range My calibrated in Nm from 0 ...		My = 0 ... ±50 Nm (0 ... ±442.51 lbs in)
Measuring range Mz calibrated in Nm from 0 ...		Mz = 0 ... ±50 Nm (0 ... ±442.51 lbs in)
Accuracy		
Relative non-linearity *		±0.2 % F.S.
Relative hysteresis		0.2 % F.S.
Characteristic curve deviation*		±0.2 % F.S.
Crosstalk		< 5 % (can be compressed using the crosstalk matrix)
Temperature effect on zero output		≤ ±0.02 % F.S./K
Temperature effect on nominal sensitivity		≤ ±0.02 % F.S./K
Electrical values		
Sensitivity (nominal) Fx:		1.2 mV/V
Sensitivity (nominal) Fy:		1.2 mV/V
Sensitivity (nominal) Fz:		0.4 mV/V
Sensitivity (nominal) Mx:		1 mV/V
Sensitivity (nominal) My:		1 mV/V
Sensitivity (nominal) Mz:		0.9 mV/V
Measurement direction		Positive output signal for compressive load / torque in the direction of the marked X, Y or Z axis
Bridge resistance		350 Ω / 700 Ω nominal (deviations are possible)
Excitation voltage		5 V DC (max. 10 V DC)
Environmental conditions		
Nominal temperature range		+15 °C ... +70 °C
Operating temperature range		-10 °C ... +80 °C
Mechanical values		
Deflection full scale		Fx and Fy < 0.04 mm / Fz < 0.015 mm
Max. operating force (for separate axes)		Fx/y max.: 150 % / Fz max: 250 % / Mx/y/z max: 150 %
Max. operational force (Dynamic load limit 250)		$Lmax = 100 * \frac{\sqrt{Fx^2+Fy^2}}{Fx\ nom.} + 50 * \frac{\lvert Fz\rvert}{Fz\ nom.} + 70 * \frac{\sqrt{Mx^2+My^2}}{Mx\ nom.} + 100 * \frac{\lvert Mz\rvert}{Mz\ nom.} \leq 250$ Please note: The sensor's coordinate origin is in the geometric center of the sensor. When calculating the maximum operational force, the additional bending moments due to leverage effects must be taken into account for the acting lateral forces. Example: Force-controlled grinding process with simultaneous dynamic loads of up to: Fx = 500 N / Fy = 500 N / Fz = 1.5 kN / Mx = 20 N / My = 20 N / Mz = 40 N $\mathbf{Lmax} = \mathbf{100} * \frac{\sqrt{\mathbf{500N^2 + 500N^2}}}{\mathbf{1000N}} + \mathbf{50} * \frac{\mathbf{1500N}}{\mathbf{2000N}} + \mathbf{70} * \frac{\sqrt{\mathbf{20Nm^2 + 20Nm^2}}}{\mathbf{50Nm}} + \mathbf{100} * \frac{\mathbf{40Nm}}{\mathbf{50Nm}} = 227.80$
Dynamic performance		recommended: 50 %
Material		high-strength aluminum
Protection class (EN 60529)		IP54
Other		
Natural frequency		> 1800 Hz
Mass	[g]	800

* The data in the area 20 % - 100 %

Geometry	
	see dimensional drawing
Installation	
Intended mounting screws	4 x M6
Tightening torque mounting screws	10 Nm
Mounting screws	strength 8.8 or higher
Weight	800 g

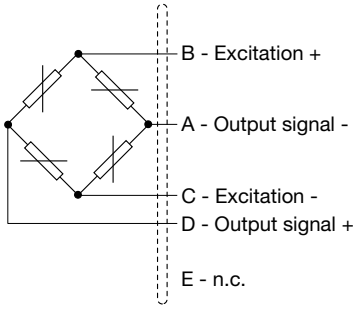
Dimensional drawing



Electrical termination

Output signal

burster load cells are based on a strain-gage Wheatstone bridge. This measurement principle means that the output voltage mV/V is highly dependent on the sensor supply voltage. Our website contains details of suitable instrumentation amplifiers, indicator and display devices and process instruments.



Connector pin assignment			
Measurement channel	**Assignment**		**Pin**
Fx	Us+	Excitation (+)	A
	Us-	Excitation (-)	B
	Um+	Measurement signal (+)	C
	Um-	Measurement signal (-)	D
Fy	Us+	Excitation (+)	E
	Us-	Excitation (-)	F
	Um+	Measurement signal (+)	G
	Um-	Measurement signal (-)	H
Fz	Us+	Excitation (+)	J
	Us-	Excitation (-)	K
	Um+	Measurement signal (+)	L
	Um-	Measurement signal (-)	M
Mx	Us+	Excitation (+)	N
	Us-	Excitation (-)	P
	Um+	Measurement signal (+)	R
	Um-	Measurement signal (-)	S
My	Us+	Excitation (+)	T
	Us-	Excitation (-)	U
	Um+	Measurement signal (+)	V
	Um-	Measurement signal (-)	W
Mz	Us+	Excitation (+)	X
	Us-	Excitation (-)	Y
	Um+	Measurement signal (+)	Z
	Um-	Measurement signal (-)	a
	N.C.		b
	N.C.		c

Electrical connection	
9900-V724	Souriau 26-pin connector, series 851 cable installation

Accessories

Connector, documents, cables and devices

Order code	
Connector	
9900-V724	Connector socket 26 pin
Documents	
8565-CTM	Crosstalk matrix for 8565 sensors
Cables	
99724-000A-0090030	Connecting cable, 3m, 3x strain gage (Fx/Fy/Fz)
99724-000B-0090030	Connecting cable, 3m, 3x strain gage (Mx/My/Mz)
99724-000F-0090030	Connecting cable, 3m, 6x strain gage
99209-724A-0090030	Connecting cable to USB interface 9206-V3xxxx, 3x force, length 3 m, suitable for drag chains
99209-724B-0090030	Connecting cable to USB interface 9206-V3xxxx, 3x torque, length 3 m, suitable for drag chains
99209-724F-0090030	Connecting cable to USB interface 9206-V3xxxx, 3x force / 3x torque, length 3 m, suitable for drag chains
Devices	
9250-VXXXXXX	Universal instrumentation amplifier
9251-VXXXX	Fieldbus controller for the 9250 instrumentation amplifier series
9236-V...	In-line instrumentation amplifier for strain gage sensors
9206-V...	USB sensor interface for strain gage sensors

4815-008565EN-5699-091535

Order Code

Measuring range	Code								Measuring range
	Fz				Mz				
Fz = 0 ... ±2 kN Fy = 0 ... ±1 kN Fx = 0 ... ±1 kN Mz = 0 ... ±50 Nm My = 0 ... ±50 Nm Mx = 0 ... ±50 Nm	6	0	0	2	5	0	5	0	Fz = 0 ... ±449.6 lbs Fy = 0 ... ±224.8 lbs Fx = 0 ... ±224.8 lbs Mz = 0 ... ±442.5 lbs in My = 0 ... ±442.5 lbs in Mx = 0 ... ±442.5 lbs in

8	5	6	5	–									–			0	0

■ Force: ~~Fz~~ / ~~Fy~~ / ~~Fx~~	0
■ Force: ~~Fz~~ / ~~Fy~~ / **Fx**	1
■ Force: ~~Fz~~ / **Fy** / ~~Fx~~	2
■ Force: ~~Fz~~ / **Fy** / **Fx**	3
■ Force: **Fz** / ~~Fy~~ / ~~Fx~~	4
■ Force: **Fz** / ~~Fy~~ / **Fx**	5
■ Force: **Fz** / **Fy** / ~~Fx~~	6
■ Force: **Fz** / **Fy** / **Fx**	7

■ Torque: ~~Mz~~ / ~~My~~ / ~~Mx~~	0
■ Torque: ~~Mz~~ / ~~My~~ / **Mx**	1
■ Torque: ~~Mz~~ / **My** / ~~Mx~~	2
■ Torque: ~~Mz~~ / **My** / **Mx**	3
■ Torque: **Mz** / ~~My~~ / ~~Mx~~	4
■ Torque: **Mz** / ~~My~~ / **Mx**	5
■ Torque: **Mz** / **My** / ~~Mx~~	6
■ Torque: **Mz** / **My** / **Mx**	7

Example order

Ordering example			
1x		Sensor with application 3x force / 3x torque	Type 8565-6002-5050-7700
1x		Connecting cable, open cable end, length 3 m, suitable for drag chains	Type 99724-000F-0090030
6x		Single-channel in-line instrumentation amplifier for strain gage sensors	Type 9236-V000
6x		Calibrate a measuring chain	92ABG

Note

■ **Brochure**
Our brochure **"Load cells – for production automation, R&D and quality assurance"** is available for download on our website or can be requested. It contains numerous applications, detailed product specifications and overviews.

■ **Product videos**
You can find our **installation videos** at: **www.youtube.com/bursterVideo**

■ **CAD data**
Download via **www.burster.de** or directly from **www.traceparts.de**