

Digital Fluid Damped Single Point Load Cell



FEATURES

- Fully calibrated and filtered digital output
- High update rate, up to 1200 updates per second
- Checkweigher function - reading acquired over period set by remote sensor trigger
- 4 opto-isolated digital inputs
- 4 opto-isolated digital outputs
- Advanced configurable digital filtering
- Safeguard access to calibration data for approved applications
- Reading on request or continuous output
- Visual indication of operating mode and errors
- Extensive diagnostics
- Fluid damped and overload protected
- Graphic User Interface(GUI) PC application enables easy setup, calibration and monitoring

DESCRIPTION

Model 240D is specifically designed for high speed/dynamic weighing. Fluid damping vastly improves the response time and fatigue life over undamped load cells.

On board electronics make it easily configurable and simple to employ in approved weighing applications. A wealth of application experience has gone into this load cell to allow weighing system designers to expedite development of their own designs - a great proportion of the functionality required to create a fully featured weighing system is already implemented in the 240D.

Communication is straight forward using an ASCII or MODBUS command structure where high update speeds are possible, making the 240D particularly suitable for check weighing. RS232 interface is available for single load cell applications and simple load cell setup.

In multi-head weighing machines, up to 128 units can be networked together over an RS485 link. 4 digital inputs allow the synchronization of the weighing with external triggers and remote operations (zero, tare). 4 digital outputs enable control functions like coarse and fine rate filling, and relieve the real-time load of the system controller.

Factory calibration ensures that each unit will be virtually identical in performance.

Graphic User Interface (GUI) PC application enables easy monitoring, setup and calibration of all load cells connected on the RS485 network. Load cell parameters can be retrieved and store for backup, and downloaded into the load cell for easy recovery from failures or changing operating modes.

APPLICATIONS

- High speed/ dynamic weighing



SPECIFICATIONS

GENERAL SPECIFICATIONS	VALUE	UNIT
Capacities	1, 2, 3, 5, 7, 10, 15, 20, 30, 50, 90	kg
Approval*	3000d	OIML (R60)
Mechanical protection	Fluid damped & overload/underload protected	
Maximum load	150	% of E _{max}
Maximum dynamic load	80	% of E _{max}
Operating temperature range	-10 to +40 (compensated) -20 to +70 (operating)	°C
Protection Class (EN6059)	IP66	
Weight	3.4	kg
Enclosure	Stainless steel or coated steel	
ELECTRICAL SPECIFICATIONS		
Input voltage.	6 to 30	Vdc
Current consumption	<100	mA
External resolution	1,000,000	Counts
Update rate	18.75, 37.5, 75, 150, 300, 600 and 1200	Readings/sec
Digital filtering	FIR, recursive or user defined	
Digital filter cut-off frequencies	FIR: 2.5, 5, 10, 20, 40, 80, and 150 Recursive: 0.25, 0.5, 1, 2, 5, 10, 20, and 38	Hz Hz
Calibration method	Dead load, mV/V or table	
Digital inputs	4, with common return	
Type	TTL or dry contact	
Settling time	<20	ms
Digital outputs	4	
Type	Open collector with common emitter	
Settling time	<20	ms
COMMUNICATION SPECIFICATIONS		
Interface	RS232, RS485	
Protocol	ASCII, Modbus	
Communication Speed	2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400	Baud
Data Bits	7 or 8	Bits
Stop Bits	1 or 2	Bits
Parity	Odd/even/none	
Termination	Internal, activated by software command	
Maximum number of networked devices	128	

* 1, 2, 3 & 90kg are not OIML approved

DIAGNOSTICS

A significant advantage of the digital load cell is in terms of cost of ownership. The analogue load cell, especially in multi-cell applications can be awkward to set up and fault find. In a production line environment, the real cost of determining and resolving equipment problems is high. Reliable and meaningful feedback about load cell operation and fault conditions are essential for fast recovery and this is where the 240D pays for itself. The 240D has a number of key features in terms of diagnostics for cell operation:

- External indication of errors - a bi-color led is used to show status and fault conditions. Even in the worst case, if communication with the load cell is not possible, the 240D can still give an indication of its health and set up.
- Validity of readings - with each reading, status characters are transmitted (good/bad/warning). Fatal errors cause readings to cease and error codes are transmitted.
- Integrity of calibration - at power up the cell(s) self check to assure:
 - Calibration
 - Consistency between units used in combination
 - The network has been changed- units added/removed



CHECK WEIGHING

The model 240 has proved itself a consistent performer in check weighing and the 240D extends its capability with features specific to this application:

1. Three types of filtering with selectable cutoff frequencies.
 - Digital FIR filter
 - Digital recursive filter
 - Digital user defined FIR filter
2. Externally triggered acquisition of weight (e.g. trigger input from PECs), with programmable delay between trigger and weight acquisition.

GRAPHIC USER INTERFACE (GUI) APPLICATION

The 240D is supplemented with a GUI PC application. The GUI application enables easy monitoring of all load cells through the RS485 network, and setup and calibration of each load cell. The user can retrieve the load cell(s) parameters, store them as a backup file and download them again into the load cell. This enable the user to define and store several operating configurations and setup of the machine and easily change from one mode to another just by downloading the desired parameters set into the load cells. The same feature can be used for easy recovery from system failures.

INSTALLATION CHECK LIST

The 240D is an accurate, repeatable instrument and to realize its full performance, a number of points should be considered.

INSTALLATION

- Mount on flat, level (ideally ground) surface, rigid enough to remain
- Level under load
- Isolate where possible, from sources of vibration (Motors, random external etc)
- Use 4 off base plate bolts, using torque of 35-40Nm (25-30lb ft)

LIVE END MOUNTING

- The weighing platform assembly should be rigid enough to avoid low frequency oscillation
- Note: settling times increase with tare load
- Use both load cap mounting bolts torqued to 16Nm (12lb ft)

INFEED OF WEIGHED ITEMS

- Avoid shock application of load from:
 - (a) Edge impact due to a step between in-feed and weighing platform
 - (b) Live weight dropped directly onto platform
- The path of the live weight over platform should be through the centre line of the load cell (length-wise)
- The weighing platform belt feed should be appropriate to the maximum live weight (live weight can cause stretching oscillation of belt)

TROUBLE SHOOTING

Anything that prevents free movement of the cell under load will cause a problem. Check:

- The transportation grub screw (centre load cap vent screw) is released
- The under side of the load cap is free of debris etc
- The filters fitted to the load cap are not blocked (special filters/ options can be provided for corrosive atmospheres, low temperatures, high humidity/very aggressive wash down)

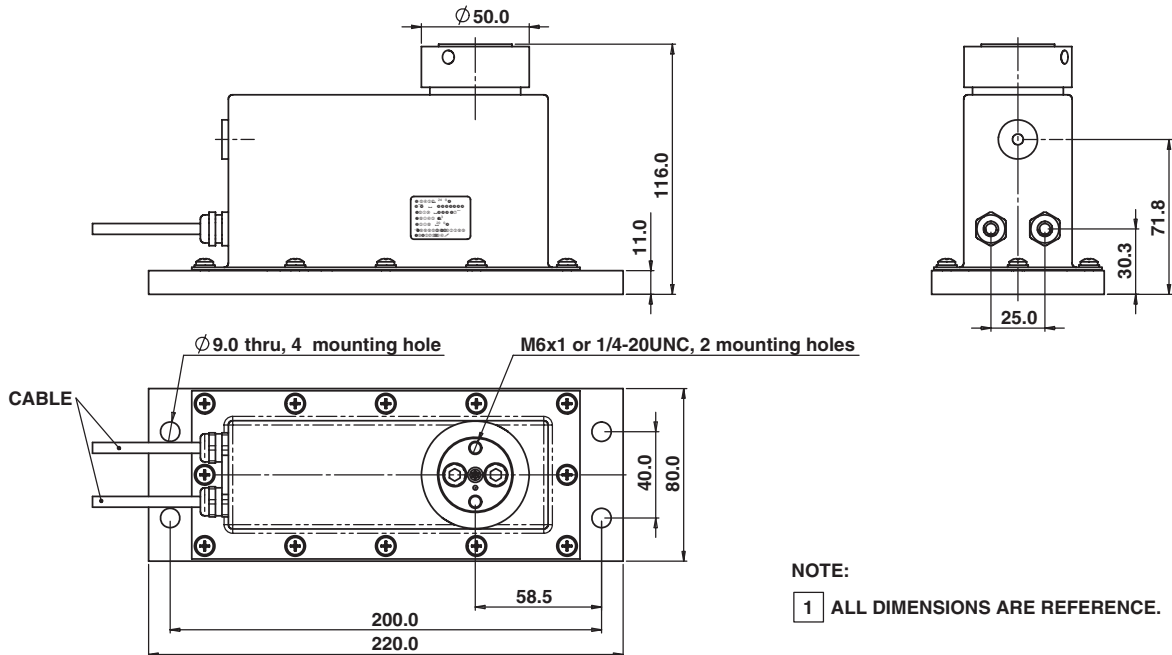
Model 240D

Vishay Tedea-Huntleigh

Digital Fluid Damped Single Point Load Cell



OUTLINE DIMENSIONS in millimeters



NOTE:
1 ALL DIMENSIONS ARE REFERENCE.

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