



**INTELLIGENT
DIGITAL POSITIONER
FOR CONTROL VALVES**

CHRONOS IDP 7600[®]



INTRODUCTION

The Chronos IDP7600 intelligent digital valve positioners are digital-pneumatic devices using microprocessor technology and the HART® (Highway Addressable Remote Transducer) communications protocol. HART® enables two-way field communications and makes it possible for additional beyond the normal process variable to be communicated to/from the positioner.

The HART® Protocol provides two communication channels one which is the 4-20mA analog signal which communicates the primary measured/set variable and the second a superimposed digital signal which contains the additional device information. The digital signal contains information from the device including device status, diagnostics, additional measured or calculated values, tuning/calibration parameters, etc. Together, the two communication channels provide the required field communication for high speed controls and data intelligence.

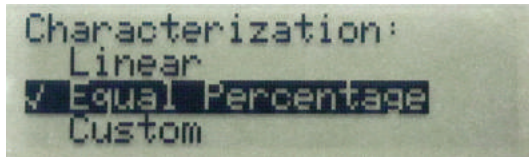
The Chronos IDP7600 provides high responsiveness and precise control with its two-stage electropneumatic relay and 16-bit microprocessor. Even under normal operation the IDP7600 is able to perform accurate diagnosis of the valve and the actuator, which contributes for carrying out predictive maintenance, reducing overall operating costs and increasing the plant uptime.

The advanced, compact and rugged design allows the Chronos IDP7000 Series positioners to be installed as double or single acting, linear and rotary actuators, and be used in all areas of industrial plants. Available options such as the stainless steel housing and remote mounting enables the IDP7000 Series to operate with reliability and durability even in harsh environments.

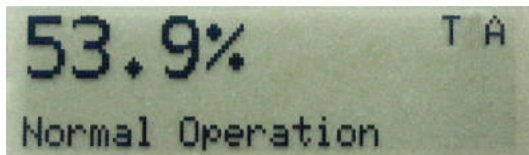
Reliability and ease-of-use with the intuitive quick setup/calibration make the IDP7600 one of the most advanced HART® positioner on the market.

GL5 SERIES CONTROL VALVE WITH CHRONOS IDP7600 POSITIONER (FIGURE 1)

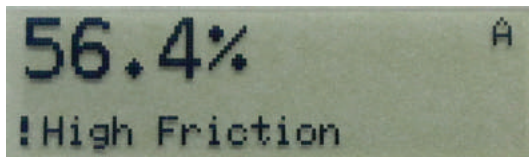




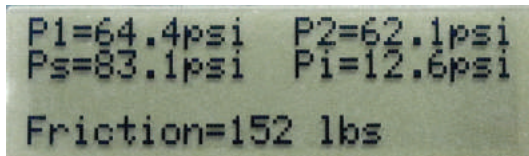
CHARACTERIZATION (FIGURE 2)



INDICATION OF NORMAL OPERATION (FIGURE 3)



HIGH FRICTION ALERT (FIGURE 4)



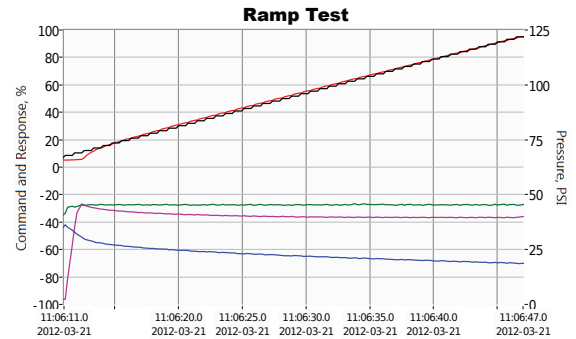
PRESSURE MONITORING (FIGURE 5)

Interface

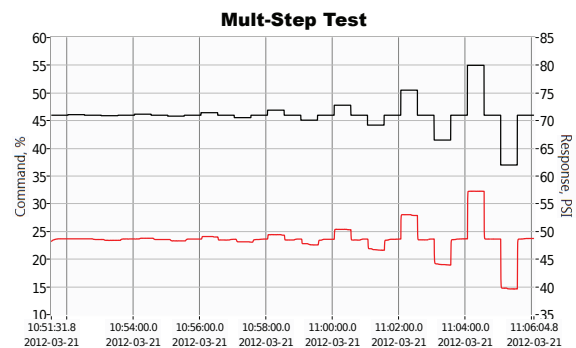
The intuitive interface of the IDP7600 positioner is comprised of a backlit, large graphical display which allows the visualization of information shown in different user-selected languages, even in low-lit areas of the plant. Three bright green, yellow and red LEDs complement the information provided in the display and allows the equipment condition to be seen even from a distance.

The valve status and diagnostic information can be viewed locally at a glance and are presented in plain language that does not require decoding. Practically all menu items can be accessed using the four buttons in the interface, with the positioner main cover closed and without the need of a handheld or laptop.

The fast and very intuitive menu facilitates configuration tasks that can be performed in a few minutes.



RAMP TEST (FIGURE 6)



MULTI-STEP TEST (FIGURE 7)

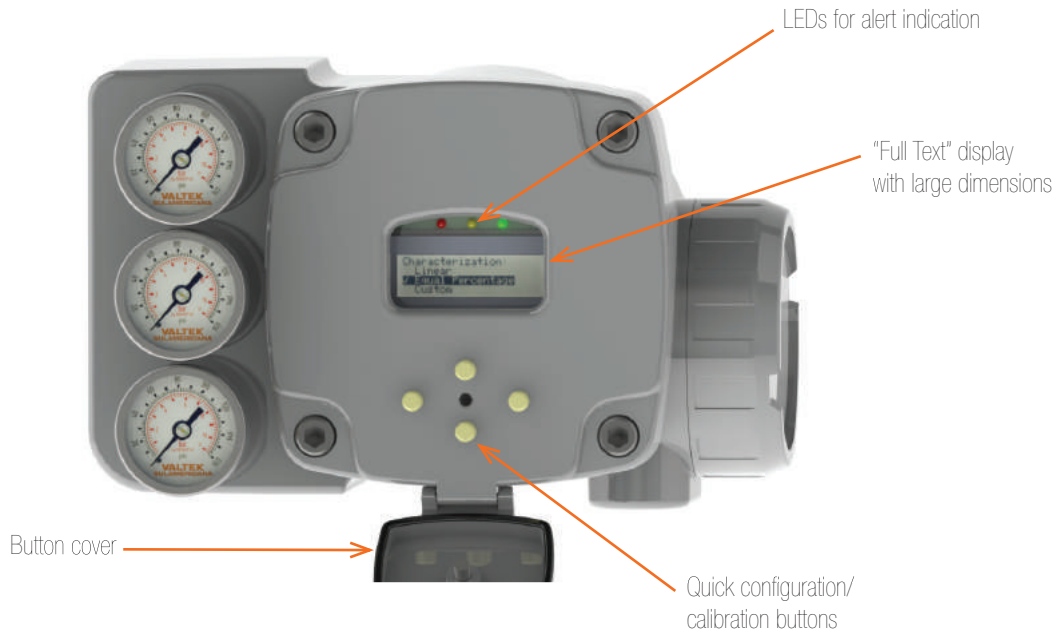
Diagnostics

The IDP7600 positioner has powerful advanced diagnostic/prognostic algorithms that operate continuously while the valve is under normal operation (without interrupting the process). It provides proactive indications of potential problems before they may cause plant shutdown. This enhanced diagnostic information can be accessed remotely via HART® enabled control and data acquisition systems, Asset management packages/systems, using visualization technologies like FDT/DTM or eDDL, as well as a HART® maintenance tools like field calibrators and handheld communicator.

Plant maintenance costs can be reduced given that only valves which require attention need to be repaired. With these and other unique features, the IDP7600 offers superior performance and reliability, provides excellent control accuracy and maximizes plant uptime

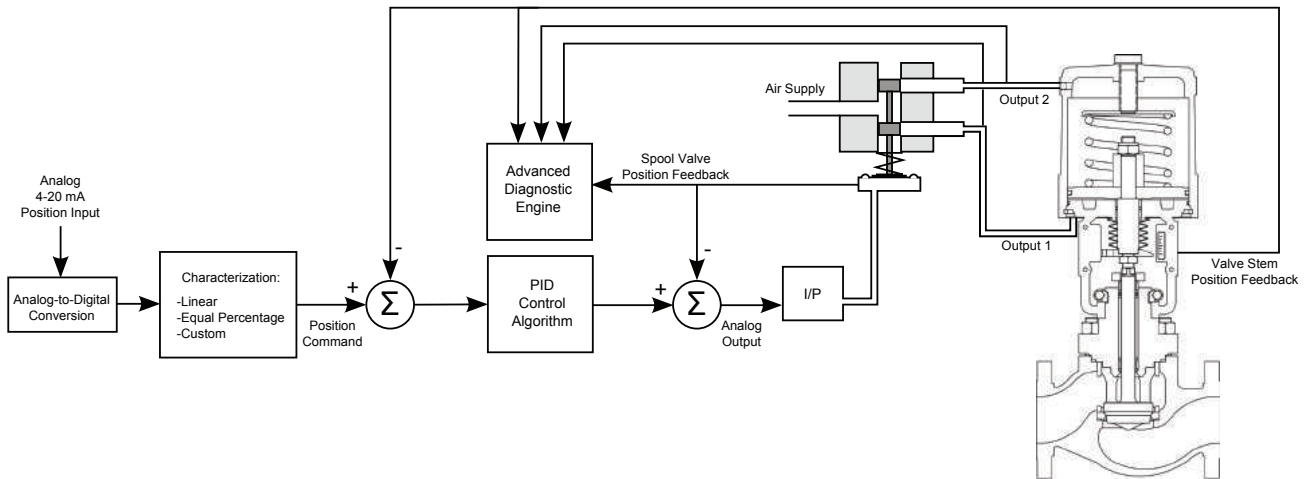
CHARACTERISTICS, ADVANTAGES

LCD AND CONFIGURATION/CALIBRATION BUTTONS OF CHRONOS IDP7600 (FIGURE 8)



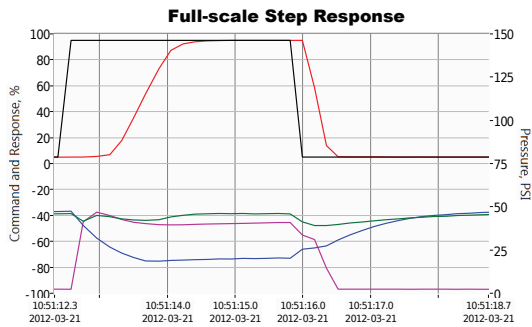
- Easy and quick configuration/calibration thanks to the “Quick Calibration Wizard”
- Auto-tune for optimizing the response in a wide variety of actuator sizes
- Local adjustment of gain
- Easy viewing of status and diagnostics messages in a large (full text) display: no need to decode cryptic messages or codes
- Backlit local display: provides easy viewing in dim areas
- Local configuration with the main cover in place – a handheld or PC is not needed
- Firmware upgradable. Upgrades are carried out with minimal interruption to the process
- Partial Stroke Test (PST) – able to test the operation of emergency shutdown valves (ESD), analyzing data and storing the last test results
- Compatible with HART 7
- Local storage for performance trend history, with data compression capacity for 25 years
- Die cast aluminum enclosure (IP66W), epoxy painted, manufactured for harsh environments
- RFI and EMI immune
- Hazardous Area certification: ATEX, FM, CSA & INMETRO (pending). Explosion proof and intrinsically safe
- Fast control loop execution time: <10 milliseconds
- Excellent control accuracy: use the advanced two-stage relay technology
- Pre-programmed with Valtek Sulamericana valves and actuators data for reporting accurate diagnostics
- Remote communication minimizes the operator exposure to hazardous areas of the plant and reduces the need of interventions in valves with difficult access
- Local storage of “Birth Certificate Signature”
- Single or double acting

ALGORITHM SYSTEM OF CHRONOS IDP7600 POSITIONER (FIGURE 9)



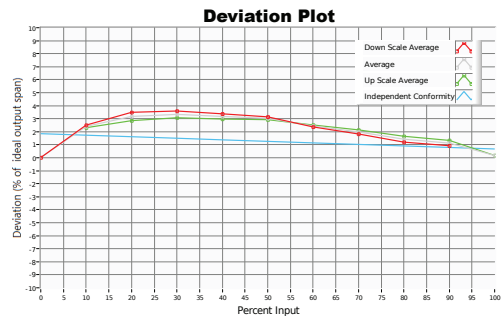
- Premium on-line predictive diagnostics: analyzes frictions, leakages through the actuator, control performance and provides other predictive indicators

- Advanced diagnostic test signatures – includes ramp test, multi step test, hysteresis and linearity, resolution and deadband, among others



FULL-SCALE STEP RESPONSE TEST (FIGURE 10)

- Training mode function to learn normal baseline and assist in alert setting
- Standard and High Flow output relays
- Mounts easily on typical linear or rotary valve actuators
- Event triggered local data logging function – “Black Box Recorder”



DEVIATION PLOT (FIGURE 11)

- Intuitive FDT/DTM standards based configuration, and diagnostics software
- Low air bleed
- Options
 - ◆ Pressure sensors for advanced diagnostics
 - ◆ Remote mounting
 - ◆ Stainless steel housing

OVERVIEW

**CHRONOS IDP7600 POSITIONER - SPECIFICATIONS & MATERIALS OF CONSTRUCTION
(TABLE I)**

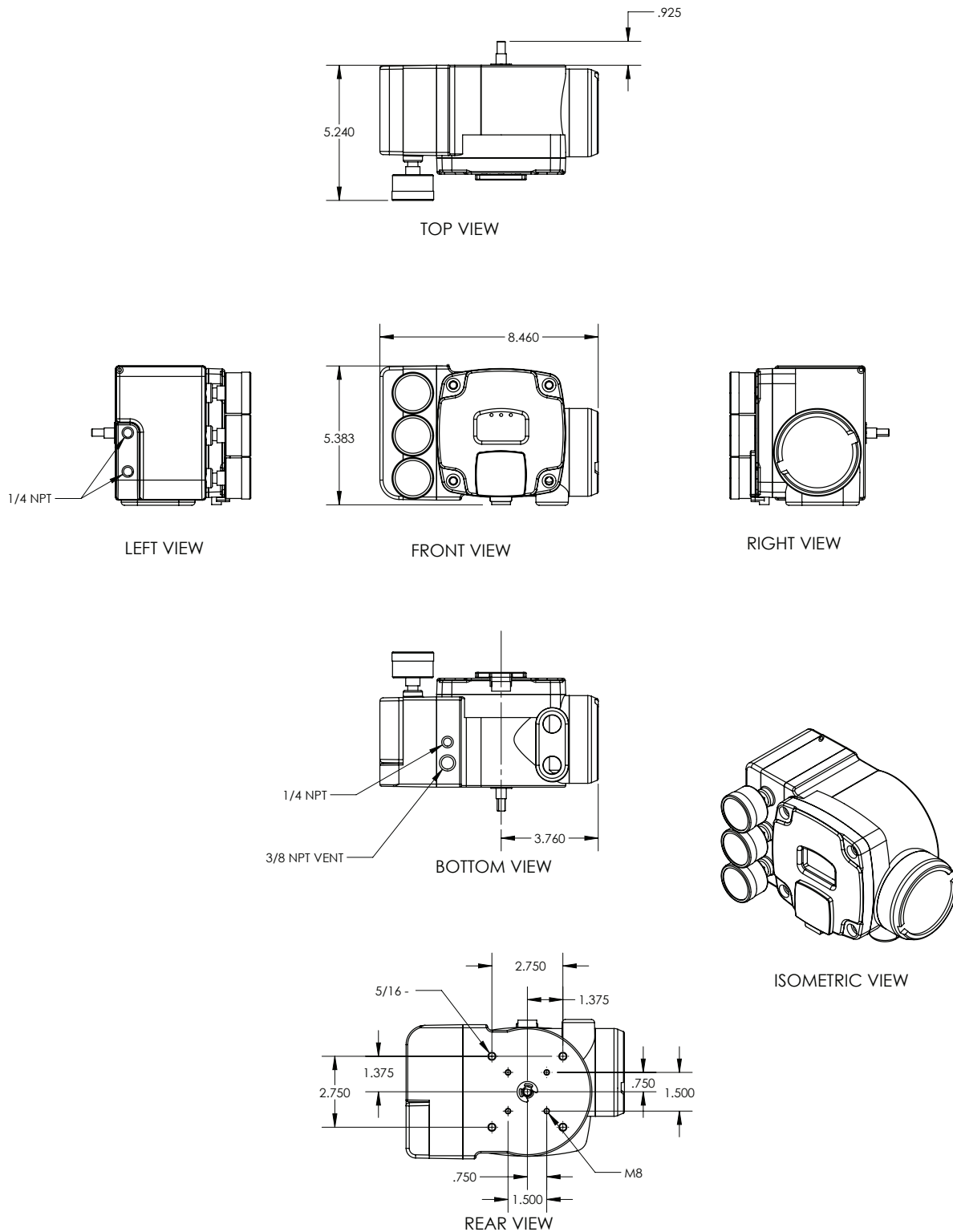
Digital Communication Protocol	
Electrical Input	2 wire bus powered, 9-32 Vdc (not polarity sensitive)
Operating Current	4-20 mA (3.6 mA minimum)
Maximum Voltage	10.0 Vdc
Hazardous Location Classification	FISCO compliant Explosion proof, flame proof, intrinsically safe and non-incendive design IECEX, INMETRO (approvals pending)
HART Version	7
Alarms	Detailed alarms for block, process and event update
Fail Safe Action	Deviation alarm user configurable to output “Zero” or “Maximum Pressure”
Characterization	Linear, Equal Percentage or user defined (21 points)
Deadband	< 0.2% F.S. ⁽¹⁾
Repeatability	< 0.05% F.S.
Linearity	< 0.5% F.S. (rotary actuators), < 0.8% F.S. (linear actuators)
Steady Air Consumption	< 0.3 SCFM @ 60 psig (0.5 Nm ³ /h @ 4.1 Barg)
Air Supply	30 - 120 psig (2.1 - 8.3 Barg) - ISA 7.0.0.1 compliant ⁽²⁾
Air Delivery	Std. flow: 14 SCFM @ 60 psig High flow: 22 SCFM @ 60 psig
Position Sensor Span	Rotary travel: 20 to 60° Linear travel: 0.4 to 12 in. (10.2 to 304 mm)
Temperature Effect	± 0.04% F.S./°F (± 0.08% F.S./°C)
Maximum Vibration	4G (5 to 15 Hz.) / 2G (15 to 2000 Hz.)
Maximum Shock	10G
Housing Material	Standard: die cast aluminum (low copper), epoxy powder coated Optional: 300 Series stainless steel
Soft Goods	Buna-N / Florosilicone
Weight	Aluminum version: 7.9 pounds (3.6 kg) Stainless Steel version: 18.9 pounds (8.6 kg)
Enclosure Rating	IP66W / NEMA 4X
Electrical Connections	1/2”-14 NPT (standard) - M20 x 1.5 (optional)
Pneumatic Connections	1/4”-18 NPT (gauges 1/8”-27NPT)
Operating Temperature Range	-40 to 185°F (-40 to 85°C)
Operating Humidity	0 - 100% non-condensing

⁽¹⁾ F.S. = Full Scale.

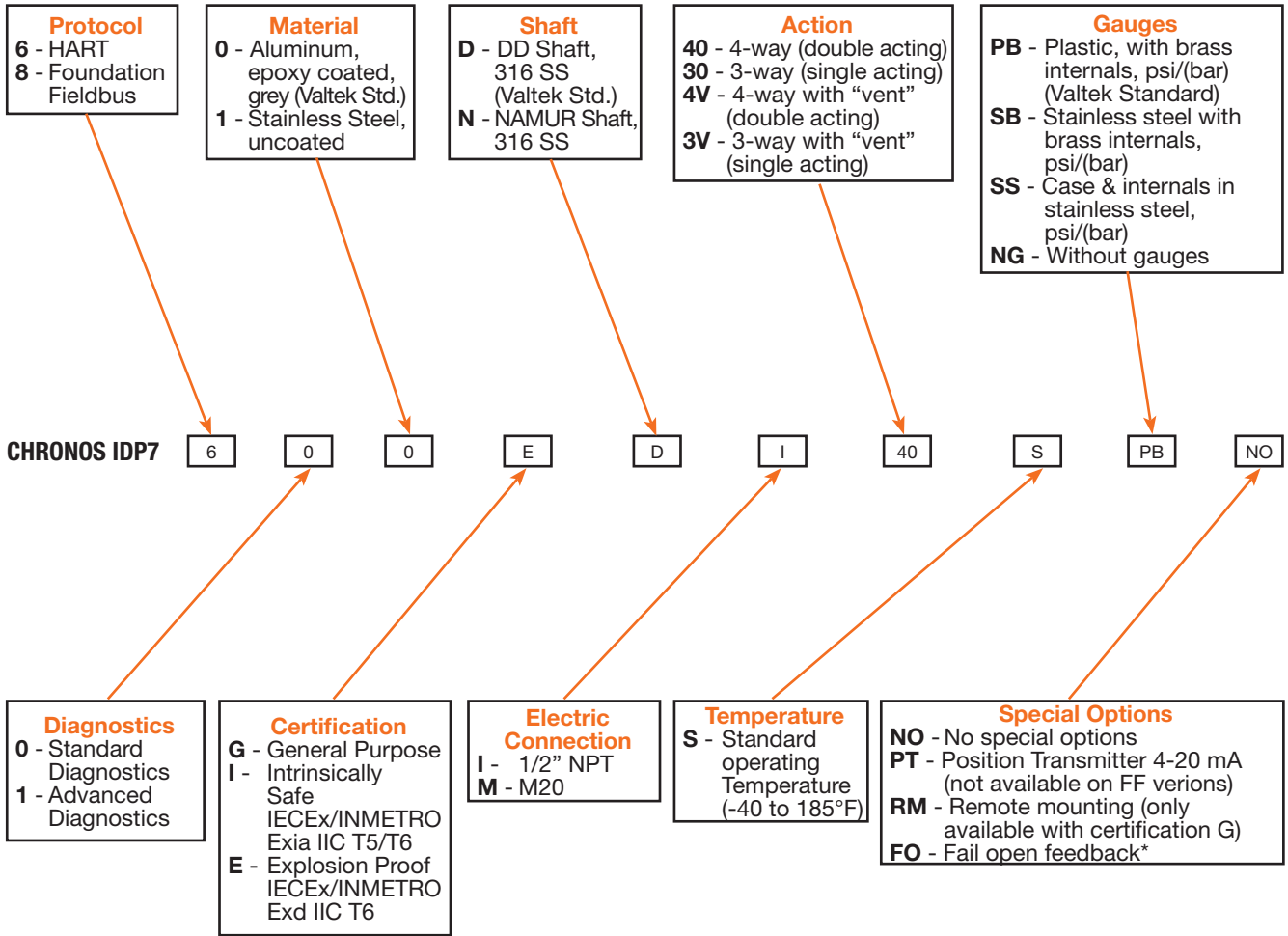
⁽²⁾ Air supply dew point must be at least 18°F (10°C) below ambient temperature, oil content not to exceed one part per million, and particle size below 5 microns (recommended below 1 micron).

DIMENSIONS - CHRONOS IDP7600 POSITIONER

CERTIFIED DIMENSIONAL DRAWING (FIGURE 12)



ORDERING INFORMATION



Quality Management System



ISO 9001-2008

Certificate No. 311001 QM

The information and specification contained in this bulletin are considered accurate. However, they are provided only for information purposes and should not be considered as certified. Valtek Sulamericana products are continuously improved and upgraded and the specification, dimensions and information contained herein are subject to change without notice. For further information or to confirm these presented here, contact your Valtek Sulamericana representative. The specific instructions for installation, operation and maintenance of the IDP7600 positioner are provided in Maintenance Bulletin #42.

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| Printed in Brazil |

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Cat. Valtek Sulamericana IDP7600 Positioner Rev. 0 05/2013E PN-9865012 (Copyright 2013 Valtek Sulamericana)