

Description

The ERNG-X is a steady state no bleed engineered system for accurate and reliable control of Natural Gas. The ERNG-X includes a pressure regulator, preconditioning filters, and an electropneumatic controller for automated control. The ERNG-X is panel mounted and can be easily installed in an enclosure or on a wall.

Applications

- Automated natural gas pressure or flow control

ERNG-X Specifications

ELECTRICAL

Power Requirement

20.5 to 28.5 VDC, 340 mA maximum, 180 mA nominal

Turn-on Time

< 240 milliseconds

Restart from Power Interruption

< 1.9 seconds

SUPPLY REQUIREMENT

Media Type

Natural Gas with a maximum upper explosion limit below 18% by volume at atmospheric conditions

Media Quality:

Corrosives: H₂S and other sulfides below 10 ppm

Impurities: CO₂ below 3%; O₂ below 0.5%

Pressure

System:

Maximum: 2750 psig / 190 bar

ER5050FX-1-002:

Maximum: 110 psig / 7.5 bar

Minimum: Outlet pressure 1 psig / 0.07 bar

Temperature

Dry gas required below 32°F / 0°C

ERNG: -4°F to 140°F / -20°C to 60°C

INPUT SIGNALS

Setpoint

USB, RS485, Downloaded Profile

4-20 mA, 1-5 VDC (ERNG-I)

0-10 VDC (ERNG-V)

Feedback (external)

ERNG-I: 4-20 mA or 1-5 VDC

ERNG-V: 0-10 VDC

PERFORMANCE⁽¹⁾

Accuracy

Measured Reference Accuracy (total accuracy all effects including zero and span error): ± 0.10% (FSO)

Low Pressure Capability with External Transducer

± 0.25 inches water (0.635 g/sq. cm) into 2 liter volume

Response Time

Sensor Update Rate: 500 milliseconds (can be adjusted between 25 milliseconds and 2,500 milliseconds)

Flow Capacity: C_v = 0.01 (Maximum Flow = 18 SLPM)

Solenoid Valve Rated Cycle Life: > 150 million cycles



PHYSICAL

Size

Gas Ports

Inlet: 1/4 - 18 NPT

Exhaust and Gauge: 1/8 - 27 NPTF

Control Port: 1/2 inch SAE with supplied adapter to 1/8 -27 NPT Male

Height: 8.5 inches / 216 mm

Length: 15.75 inches / 400 mm

Width: 6 inches / 152 mm

Conduit Openings: Two, 1/2 NPTF

Weight

ERNG: 12.5 lbs / 5.7 kg

ER5050FX-1-002 Housing

Standard: NEMA 4X IP66 (aluminum and epoxy polyester paint)

Optional: Stainless steel

Flow Stream Materials

Solenoids: Nickel-plated Brass, FKM Seat and O-rings

Fittings: Brass, 316 SST

Seats: FKM, PCTFE, PTFE, DELRIN

Body: Aluminum, 316 SST, Brass, Nickel Plated Brass

Filter Element: Borosilicate Glass

Sensor: Glass, Ceramic, Silicon, RTV, Nickel

Tubing: Polyurethane, 316 SST

O-rings: Buna-N, FKM Teflon

Mounting

Four through holes that allow 3/8" or 9 mm bolts (14.75 x 5 inch / 374.7 x 127 mm Bolt Pattern)

Mounting Orientation Effect

Filter Drain Vertically Down

- continued -

1. With clean dry sweet gas.

ERNG-X Specifications (continued)

ENVIRONMENT

Temperature Range
-4°F to 140°F / -20°C to 60°C

Relative Humidity
To 100% R.H. (non-condensing at
32°F to 140°F / 0°C to 60°C)

Storage Temperature
-58°F to 200°F / -50°C to 93°C

CERTIFICATIONS

CE Approval
All ER5000 units have CE approval when wired per CE approved wiring instructions in the *ER5000 User Manual*

Hazardous Location Approvals on ER5050FX-1-002 Only

CSA, IECEX, ATEX
Class I, DIV 1, Groups BCD T5
Class II, DIV 1, Groups EFG
Class III
Ex db IIB+H2 T5 Gb
Ex tb IIIC T100°C Db IP6X
Zone 1, AEx d IIB+H2 T5 Gb
Zone 21, AEx tb IIIC T100°C Db IP6X

Features and Benefits

ERNG-I

- Precise accuracy
- 16 Bit for Data Acquisition
- Steady state no bleed
- Control algorithms for Internal Feedback, External Feedback or Cascade Control modes
- Selectable **SETPOINT Signal** Source
 - USB (Not recommended)
 - RS485
 - External analog (4-20mA or 1-5VDC)
 - Downloadable Profile (runs independent of PC or external analog source)
- Selectable **FEEDBACK Signal** Source
 - Internal Sensor (0-100 psig / 0-6.9 bar)
 - External Analog: 4-20mA or 1-5VDC
- Selectable Control Limits
 - Programmable limits for analog setpoint, feedback and error signals
 - Selectable control states: "Hold Last Pressure", "Vent", or "Full Open"
- TESCOM ERTune™ software provided for data acquisition, PID tuning (real time graphic display of setpoint and feedback), creating and downloading profiles
- TESCOM DLL provided for easy custom software development
- Software examples are provided for VB.NET, LabVIEW, C and C#
- Trigger data acquisition based on system events
- Two additional analog/digital inputs and two digital outputs that allow the user to:
 - Monitor an external signal in addition to feedback (e.g. flow, temp, force)
 - Alternate between two separate external feedback sources
 - Start/Stop or Resume/Pause pressure profiles
 - Wait for event to occur before proceeding to the next step in a downloaded profile (digital input)
 - Indicate that an event occurred in a downloaded profile (digital output)
- Analog output of the internal pressure sensor
- Conditional control with "IF/THEN" and "GoTo" profile commands
- Suspend control feature to lock output pressure for an extended period of time
- ER5050FX-1-002: NEMA 4X and IP66 (water tight, corrosion resistant)

ERNG-V

- All features of the ERNG-I except with 0-10 VDC Setpoint and Feedback signals

Special Control Features Available

- Suspend Mode
- Diaphragm protection
- Pulse Mode
- Control Limits

ERNG-X Dimensions

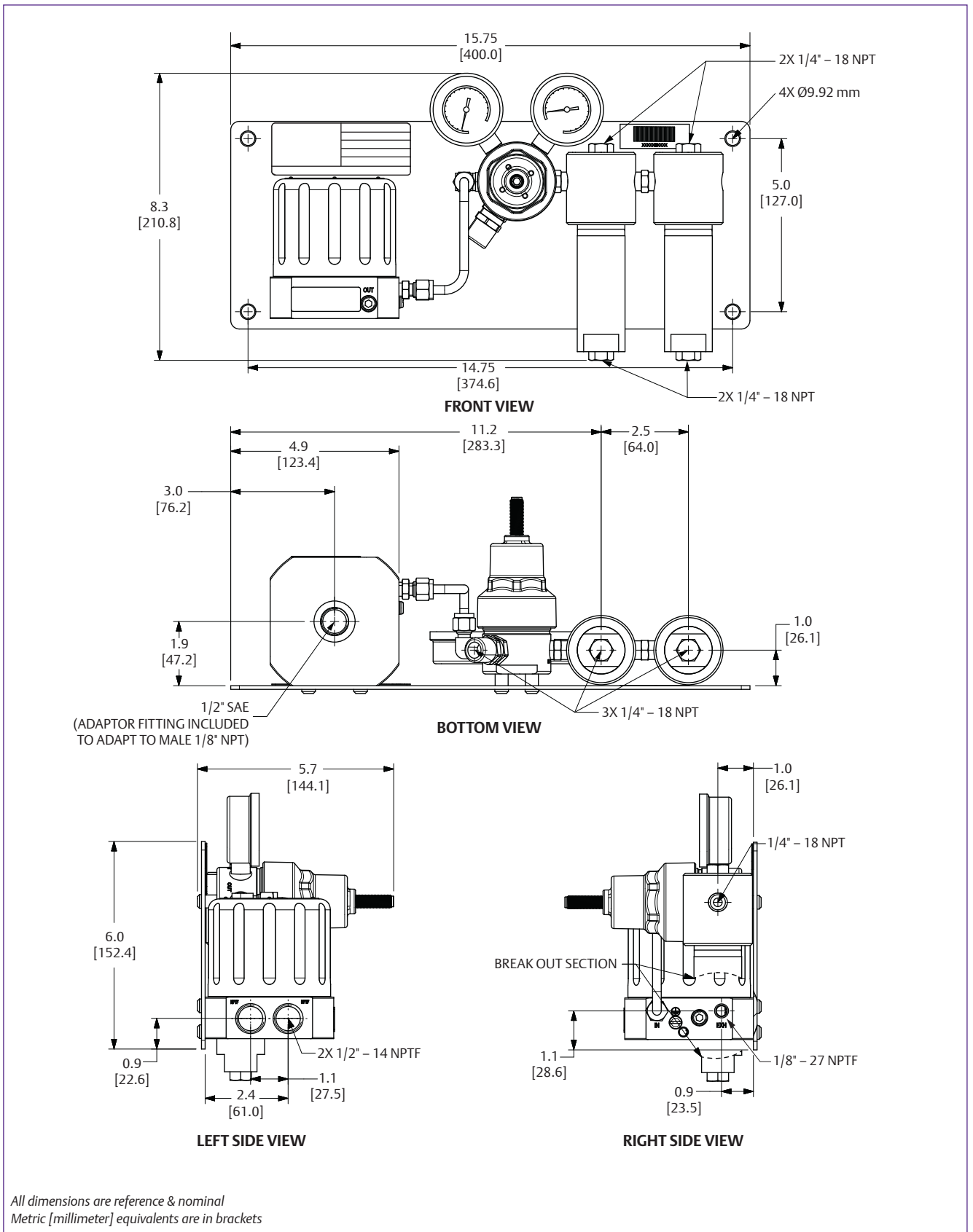


Figure 1. ERNG-X Dimensions

ERNG-X Typical Applications

The following diagram is an example of a typical ERNG-X application. Remote set point control for a district station. The ERNG-X controls the downstream pressure on the pipeline main regulator by varying the spring case pressure of the pipeline pilot regulator.

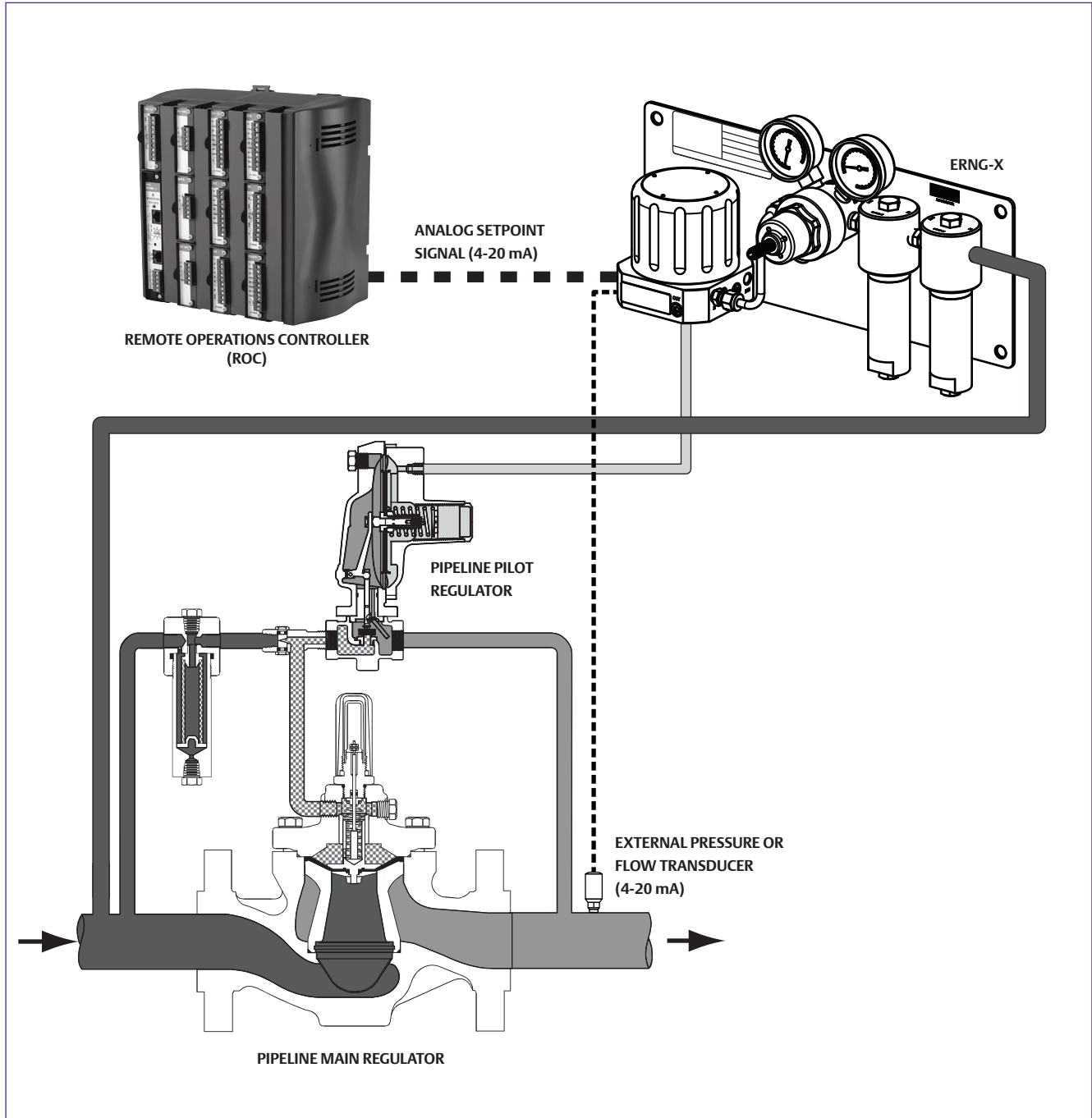


Figure 2. ERNG-X Typical Applications

ER5000 Basics

ER5000 System Requirements

All ER5000 controllers require:

- Power: 24 VDC, 340 mA maximum, 180 mA nominal
- Setpoint signal: From PC, PLC, Analog
- Feedback signal: Internal or External

The ER5000 senses system pressure using either its internal sensor or a user supplied external transducer (4–20 mA, 1–5V or 0–10V) placed within the actual process line. You can operate the ER5000 in one of three control modes:

- Internal Feedback, which uses only the internal sensor;
- External Feedback, which uses only the external source;
- Cascade, which uses both internal and external sources in a “loop within a loop” configuration

ER5000 Communication

The ER5000 communicates using a USB or RS485 interface. The required USB driver is provided on the ER5000 User Support Software and Manual CD or online. An RS485 communications link can be established between the ER5000 and a PC using either a USB to RS485 or RS232 to RS485 converter. RS485 communication must be used for daisy-chaining two or more (up to 32) ER5000s on the same network. RS485 is recommended for ERNG-X communication. USB is not recommended for hazardous locations and is also not recommended for distances greater than 10 ft.

ERTune™ Software Features

TESCOM's ERTune™ program is an all encompassing software package which allows the user to address the ER5000 controller using a PC. ERTune™ allows users to tune the PID loop, monitor system operation, create and download profiles, specify control limits, enable password protection, acquire data and review previously recorded data. The basic screens are Tuning, Profile, Data, Configure and Diagnostic Tools.

ER5000 Software Development Support

The ER5000 protocol document is provided to assist in developing process control software that communicates with the ER5000 on any platform. Sample programs in VB.NET, LabVIEW, C and C# are available on the included CD along with the source code for the ER5000 DLL for Windows.

The TESCOM implementation of the protocol uses six functions to communicate: StartUp, ReadNetVar, WriteNetVar, ReadProfileSegment, WriteProfileSegment and Shutdown.

ER5000 Tuning

The ER5000 is factory set to default PID parameters. The user can also adjust the Proportional, Integral and Derivative (PID) variables to:

- Achieve the quickest response to a setpoint change without overshoot or oscillation
- Achieve the best performance for a non-changing setpoint
- Optimize performance in the specific application conditions

Refer to ER5000 user manual for more information.

ERNG-X Part Number Selector

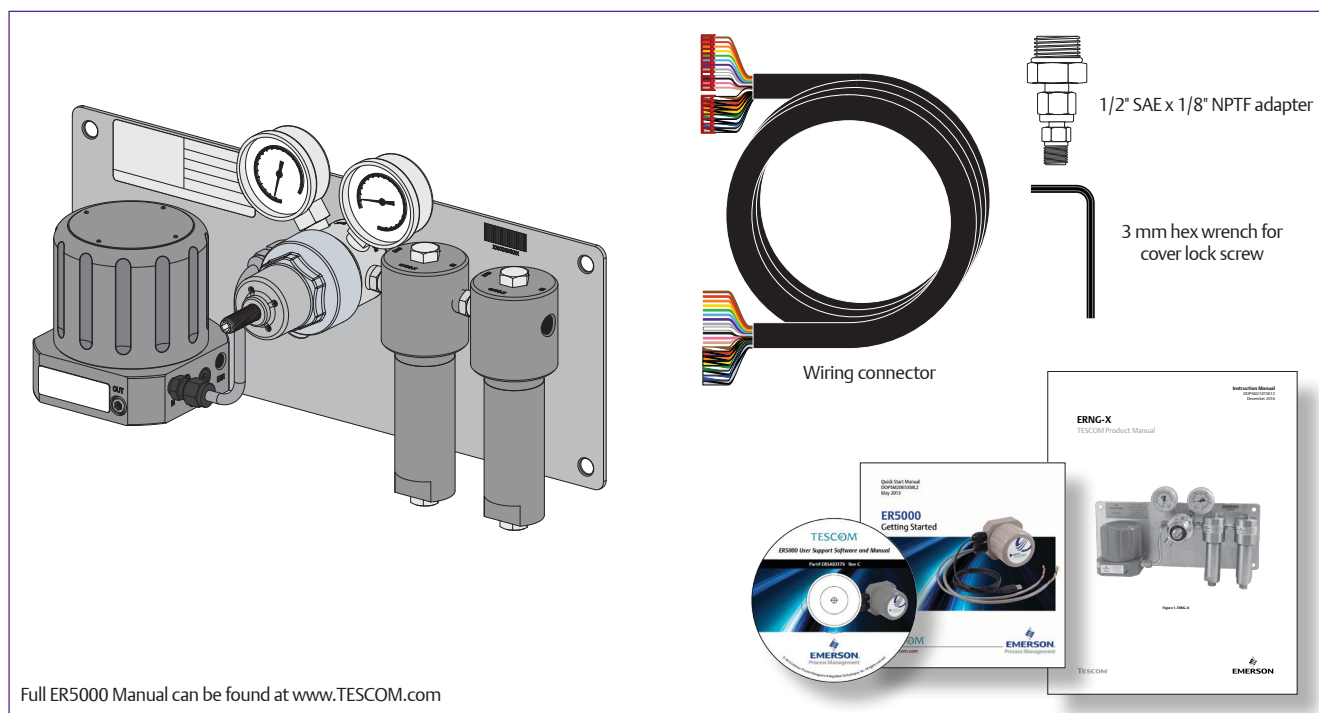
Repair Kits, Accessories & Modifications may be available for this product. Please contact TESCOM for more information.

Example for selecting a part number:

ERNG	-	I	
BASIC SERIES		DASH NUMBER	EROPTION
ERNG		I	Current
		V	Voltage

RECOMMENDED SPARE PARTS		PART NUMBER
Supply Regulator Repair Kit		JT389-8927
Filter Elements Kit	C195-1	ERAA23983-1
	C195-2	ERAA23983-2

What's Included



WARNING! Do not attempt to select, install, use or maintain this product until you have read and fully understood the *TESCOM Safety, Installation and Operation Precautions*.

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