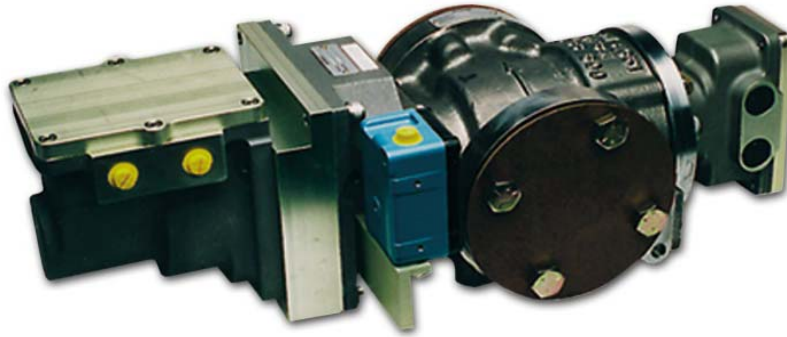


3103 Gas Valve with EM35MR Electric Powered Actuator



Applications

The 3103 gas valve is a stainless steel valve capable of metering gas flow between 23 kg/h and 18 144 kg/h (50 lb/h and 40 000 lb/h). It is designed to be corrosion resistant and self-cleaning, allowing it to operate in sour gas environments (high sulfur content gas) that can cause problems for other valves. When used in conjunction with an EM35MR actuator, the 3103 valve delivers the demanding accuracy needed for DLE applications.

The EM35MR actuator is all electric, so hydraulic contamination and maintenance problems are eliminated. Cost is reduced since there is no HPU to maintain or replace. In addition, the EM35MR actuator is designed for long life, although it may be replaced in the field if necessary.

Description

The 3103 gas valve is a rotary sleeve-and-shoe type throttling valve. The metering port area is determined by input shaft position from the actuator. Valve position feedback to the actuator driver is accomplished using a high accuracy resolver. The EM35MR actuator is designed for use with the DVP (Digital Valve Positioner). The motor is a brushless dc motor with a motor clutch and gear-head assembly. The motor uses Samarium Cobalt permanent magnets bonded and sleeved to the rotor element. Rotor position sensing is performed through the use of a resolver.

Features

The EM35MR motor assembly is housed in a cast aluminum, explosion-proof housing. A thermal potting compound is used to transfer heat generated by the motor to the cast housing and out to the ambient environment. The motor output shaft is directly coupled to the valve input shaft through the use of a stainless steel torsional coupling.

DVP Digital Valve Positioner

The Woodward DVP is the state-of-the-art driver for electric actuation. It features a rugged and compact design. The DVP is designed for use with various Woodward valves and actuators. It provides positioning based on a demand signal from the control system. Multiple-input-type configurations allow the DVP to be used with many different turbine controllers. The driver supports redundant installations. The DVP is designed to control valves and actuators with either limited angle torque (LAT) or brushless DC (BLDC) motor types. The driver positions based on resolver feedback located on the valve or actuator. The DVP uses the latest in Woodward control architecture, the robust controller to provide high-speed precise valve control. See Woodward Product Specification 03376 for additional information.

- Highly accurate
- Ideal for demanding DLE applications
- All electric
- Low maintenance
- Designed for long life
- Integral part of the total turbine control system
- Models are available with certifications for North American Hazardous Locations
- Models are available compliant with the applicable CE Directives – ATEX, Pressure Equipment, Machinery, EMC

3103 Gas Valve Specifications

SUPPLY CHARACTERISTICS

Contaminants

Solid particles
 <10 µm diameter 30 ppm by volume maximum
 >10 µm diameter 0.3 ppm by volume maximum

Metered Fuel Types

Natural, propane, methane service

Specific Gravity

0.5 to 1.05

Ambient Temperature

(-40 to +93) °C / (-40 to +200) °F

Fuel Temperature

(-40 to +149) °C / (-40 to +300) °F

GAS FLOW REQUIREMENTS

Inlet Pressure(Standard)

6205 kPa absolute (900 psia) maximum (CSA)
 4964 kPa absolute (720 psia) maximum (CSA and CE)

Inlet Pressure (Enhanced)

6205 kPa gauge (900 psig) maximum (CSA and CE)

Pressure Differential

(172 to 6205) kPa / (25 to 900) psi

Gas Flow Range

(23 to 18144) kg/h / (50 to 40000) lb/h (0.6 sp gr) maximum
 flow capacity is dependent upon available gas conditions

Accuracy Standard

+5 % of point, or +0.25 % of maximum flow, whichever is larger

High Accuracy Dry Low Emissions Applications

2 % of point (consult Woodward)

EM35MR Actuator

MECHANICAL

Output Shaft Rotation

60° (rotation limited by valve stops)

Continuous Output Torque

+24.9 N•m (+220 lb-in) maximum

Peak Output Torque

+62.4 N•m (+552 lb-in) minimum

ELECTRICAL

Power Input

28 V (dc) nominal
 (18 to 32) V (dc) operating

Current

37 A, maximum for 50 ms
 15 A, maximum continuous

PERFORMANCE

Slew Rate

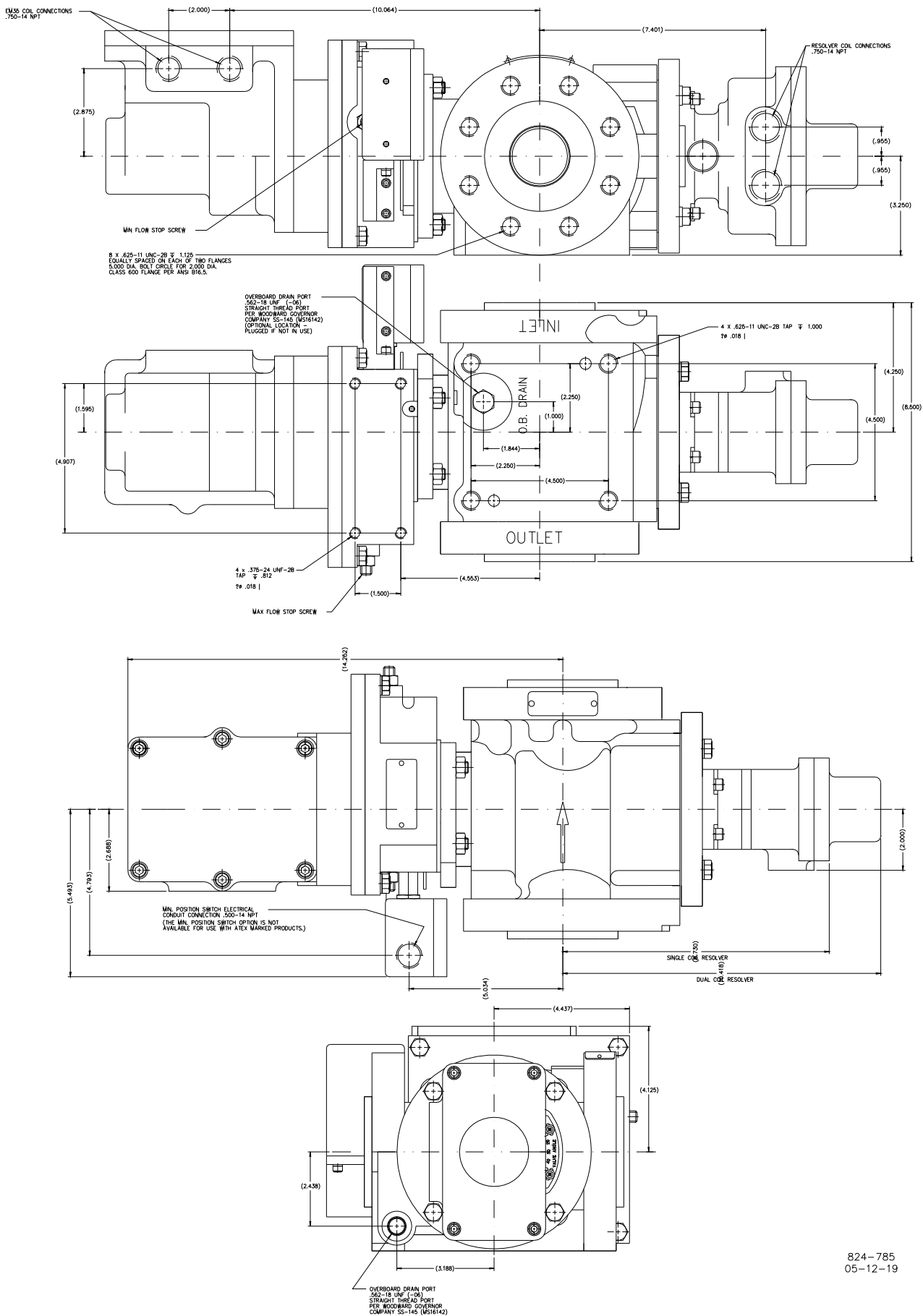
150 ms to open the valve and 80 ms to close the valve
 (internal spring adding) at a nominal line voltage of 28 V (dc)

Bandwidth

>5 Hz

Position Accuracy

0.50° analog
 0.10° digital



824-785
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Outline Drawing of EM35MR Actuator/3103 Gas Valve
(Do not use for construction)

Regulatory Compliance

European Compliance for CE Marking:

Pressure Equipment Directive (Valve):	Certified to Pressure Equipment Directive 97/23/EC of 29 May 1997 on the approximation of the laws of the Member States concerning pressure equipment, Category II by TUV Rheinland-Industrie Service GmbH (0035).
ATEX—Potentially Explosive Atmospheres Directive (Actuator, Resolver):	Declared to 94/9/EEC COUNCIL DIRECTIVE of 23 March 1994 on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres. SIRA 13 ATEX 1188 X Ex d IIB T3 X Gb EM35/EM35MR Actuator and 3103 Valve assemblies incorporating the minimum position switch are not suitable for use in an ATEX environment.

Other European Compliance:

Compliance with the following European Directives or standards does not qualify this product for application of the CE Marking:

ATEX (Valve):	The 3103 is exempt from the ATEX Directive 94/9/EC as non-electrical equipment bearing no potential ignition sources per EN 13463-1. Suitable for installation in II 2 G atmosphere with Group IIC.
EMC Directive:	Not applicable to this product. Electromagnetically passive devices are excluded from the scope of the 2004/108/EC Directive.
Machinery Directive:	Compliant as partly completed machinery with Directive 2006/42/EC of the European Parliament and the Council of 17 May 2006 on machinery.

North American Compliance:

These listings are limited only to those units bearing the UL and/or CSA identification. Suitability for use in North American Hazardous Locations is the result of compliance of the individual components:

Actuator:	CSA Certified for Class I, Division 1, Groups C & D; Class I, Division 2, Groups B, C, and D, T3. For use in Canada and the United States.
Minimum Position Switch:	CSA Certified for Class I, Division 1, Groups C & D; Class II, Division 2, Groups E, F, and G. LR57324. UL Listed for Class I, Division 1, Groups C & D, Class II; Division 2, Groups E, F, and G. E14274.

Special Conditions for Safe Use

Wiring must be in accordance with North American Class I, Division 1 or 2 or European Zone 1 wiring methods as applicable, and in accordance with the authority having jurisdiction.

Ambient Temperature

(-40 to +93) °C / (-40 to +200) °F

Fuel Temperature

(-40 to +149) °C / (-40 to +300) °F

Use supply wires suitable for a maximum ambient temperature of +93 °C. For ATEX Zone 1 and Zone 2 Applications: A conduit seal must be installed within 50 mm (2 inches) of the conduit entries when the EM35MR Actuator and EM Resolvers are used in a Zone 1 or a Zone 2 ATEX classified explosive atmosphere. These are Category 2, flameproof, type 'd' products. For Class I, Division 1 or Class I, Zone 1 North American Applications: A conduit seal must be installed within 45 cm (18 inches) of the conduit entry when the EM35MR Actuator or EM Resolvers are used in a Class I, Division 1 or Class I, Zone 1 hazardous atmosphere. The surface of the gas valve is dependent upon the temperature of the fuel. Refer to the burn hazard warning statement in the manual for safe handling. Fuel temperature effects on valve surface temperature must be taken into consideration when this product is used in an explosive atmosphere.

Technical Manual 26734



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