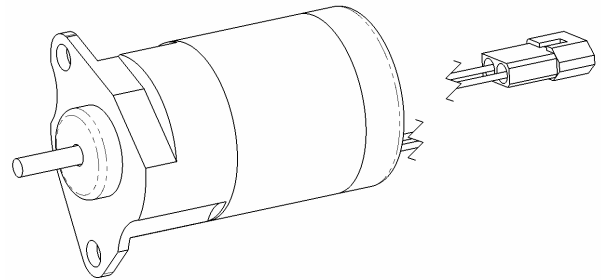
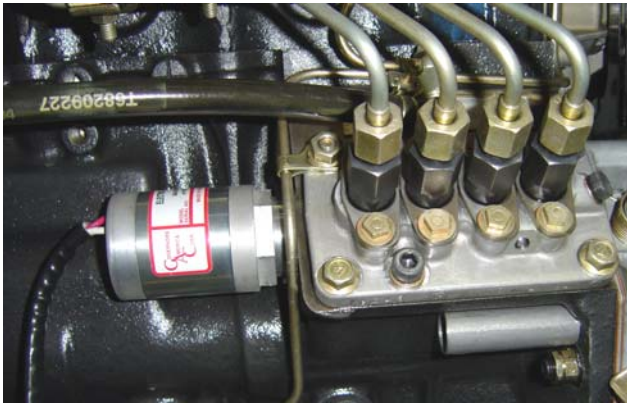


ALR-190-Series Integral Actuator



Introduction

The ALR-190 Series Integral Actuator is designed to mount integral to various injection Pumps of small engines. No external linkage or brackets are required to install this actuator. Also, when de-energized the ALR-190 Series electric actuator provides the function of fuel shutoff solenoid. This is accomplished by internally moving spring-loaded the fuel-rack to the no fuel position.

Installing the ALR-190 Series actuator does not defeat the engine's mechanical governor operation. During the installation process, the mechanical governor is set 200-300 rpm higher than the electric governor's operating speed. In this configuration the mechanical governor acts as an overspeed protection and engine-power limiter, within engine manufacturers specifications.

The electromechanical design used in the ALR-190 Series is field proven and provides a proportional actuator movement based on the actuator coil current.

System Description

This actuator is an electromagnetic servo device which, when installed becomes an integrated, closed loop fuel control system. This system can be described as follows: Electrical pulses,

generated by the magnetic speed sensor, are directly proportional to the engine speed. These pulses are transmitted to the control, which will compare the real-time pulses to the preset engine speed setting. If the real-time pulses differ from the preset engine setting, the control will deviate the current to the electric actuator proportional to the difference. This deviation in current will cause the actuator shaft to move thus adjusting engine speed to the preset engine speed setting.

Since there are no sliding parts in the ALR-190 Series electric actuator, outstanding performance, reliability and no maintenance are the resulting qualities.

Wiring

The ALR-190 Series actuator is designed to have a dedicated 12 *or* 24 volt coil. These actuator models are identified in [Table A](#). You must be sure that the actuator voltage matches the battery supply voltage when ordering.

An actuator cable harness is used to link the ALR-190 Series actuator to the selected GAC speed control unit. There are no polarity connections from the speed control unit to the actuator which need to be observed. For more information on additional wiring, see literature specific to the control being used.

*Solutions for combustion engines,
that work right from the beginning.*

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Recommended GAC Speed Governors

Analog	Digital
ESD-2402-12 or -24	SDG-725/-735 Series
ESD-1000 Series	IGC-745 Series
ESD-5100 Series	

Installation

Note: Before installing the actuator to the fuel pump, make sure that the engine can NOT be started. Remove the battery connection from the starter and depress the emergency button.

Warning:

An Overspeed shutdown device, independent of the governor system, should be provided to prevent loss of engine control which may cause personal injury or equipment damage.

Specifications

Electrical

Operating Voltage (Dedicated Coil) 12 or 24 VDC Available
 Coil resistance 1.7 Ω for 12 VDC
 or 7.2 Ω for 24 VDC
 Maximum Current (Continuous)..... 7 A @ 12 VDC
 or 3.3 A @ 24 VDC

Environmental

Operating Temperature Range..... -40° to 180°F (-40° to 85°C)
 Relative Humidity Up to 100%

Physical

Dimensions..... see dimensional drawings
 Weight..... 1.35 lbs (0.61 kg)
 Mounting Directly to injection pump, in place of stop solenoid

Reliability

Testing All Units 100% Tested

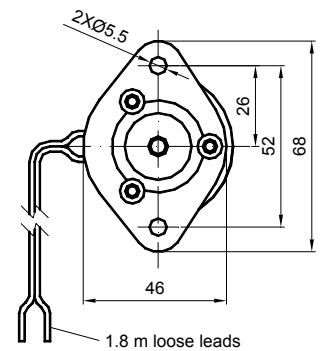
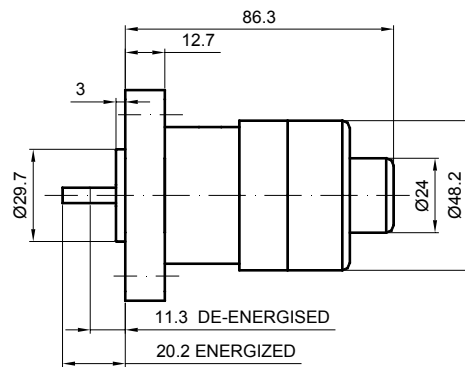
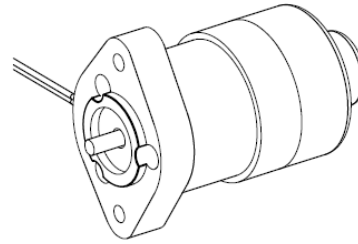
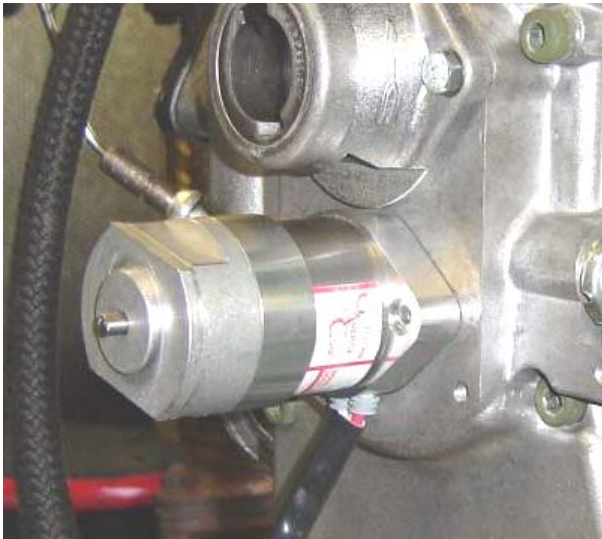
Mating Hardware

All models come with mounting hardware and O-ring.

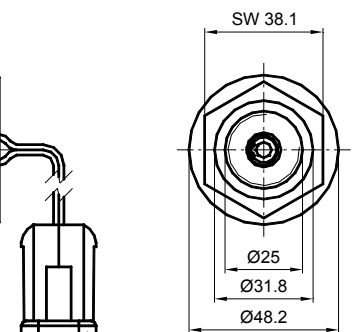
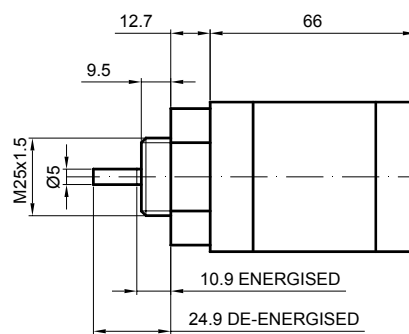
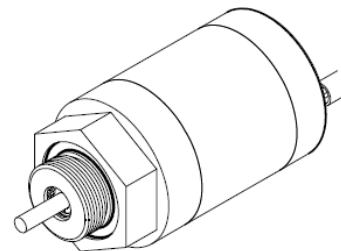
Table A: Available Actuator Types

Engine Make	Engine Model	Actuator Type 12 VDC	Actuator Type 24 VDC	Recommended Speed Sensor
FARYMAN	18W	ALR-190-F05-12	ALR-190-F05-24	MSP-6729
ISUZU	2CA 3CA / 3CB / 3CD 3CDT 3LB1 3LD1 / 3LD2 4LE1 / 4LE2	ALR-190-I04-12	ALR-190-I04-24	MSP-6729
KUBOTA Super 05 series	D905 D1005 D1105 / D1105-T V1305 V1505 / V1505-T	ALR-190-K04-12	ALR-190-K04-24	MSP-6729
KUBOTA V3 series	V3300 V3800	ALR-190-K04-12	ALR-190-K04-24	MSP-6729
KUBOTA Super 03M series	D1503M D1703M D1803M V2003M V2403M	ALR-190-KM04-12	ALR-190-KM04-24	MSP-6729
mitsubishi	L2E L3E S3L S3L2 S4L S4L2	ALR-190-M05-12	ALR-190-M05-24	MSP-6730
PERKINS	404	ALR-190-P04-12	ALR-190-P04-24	MSP-6730 + adapter HW-EG-1366
YANMAR TNV series	2TNV70 3TNV70 3TNV76 3TNV82A 3TNV84 / 3TNV84T 3TNV88 4TNV84 / 4TNV84T 4TNV88 4TNV94L 4TNV98 / 4TNV98T	ALR-190-Y04-12	ALR-190-Y04-24	MSP-6729
YANMAR V series	2V75 2V78	ALR-190-Y78-12	ALR-190-Y78-24	MSP-6729

FARYMAN ALR-190-F05-XX

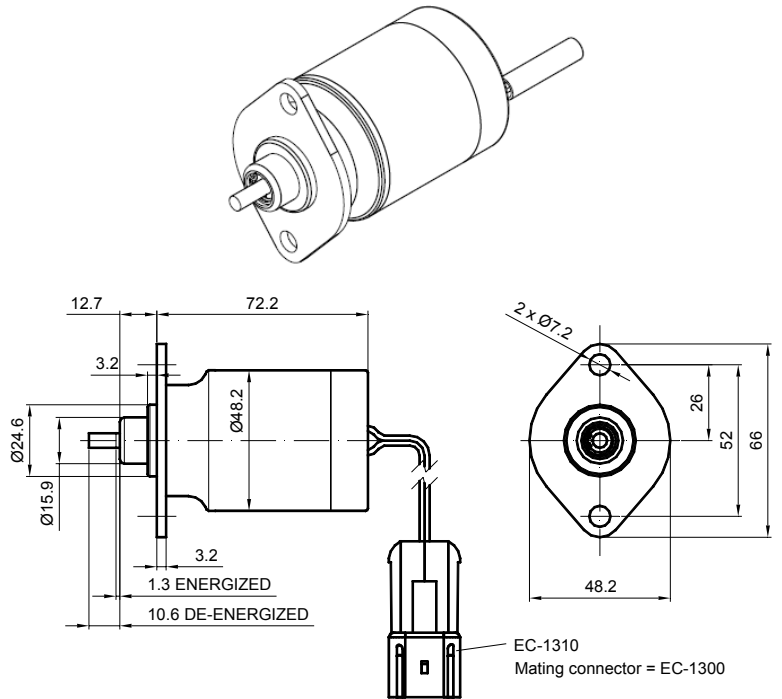
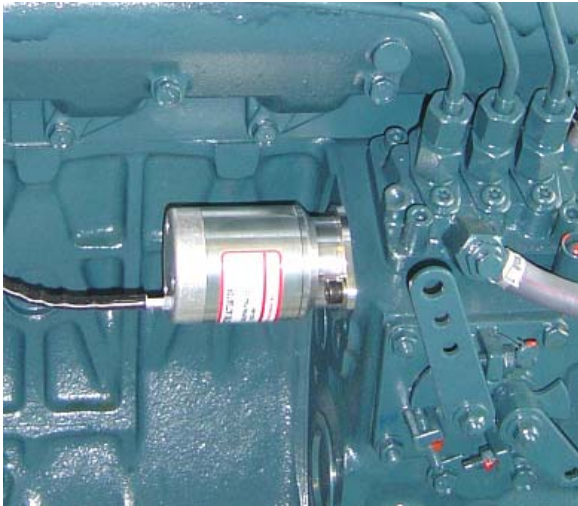


ISUZU ALR-190-I04-XX

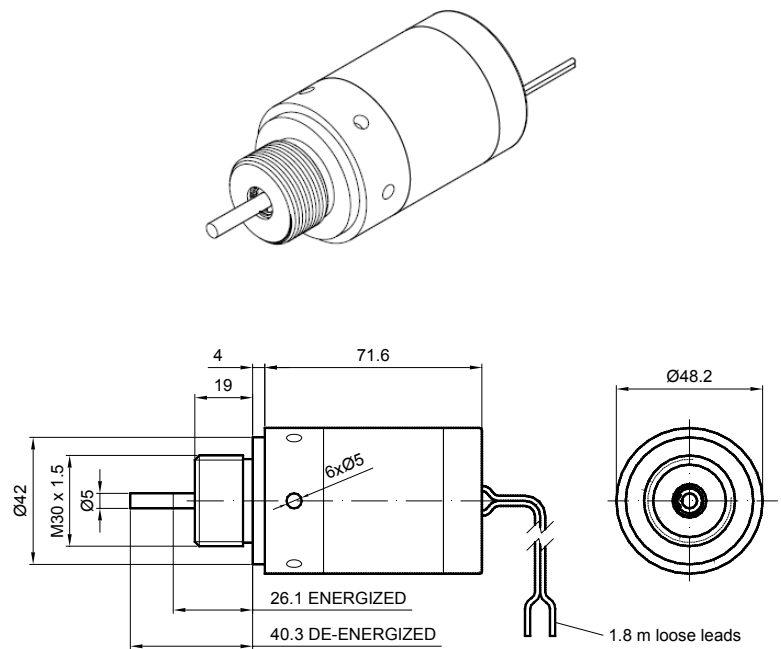


EC-1310
Mating connector = EC-1300

KUBOTA ALR-190-K04-XX

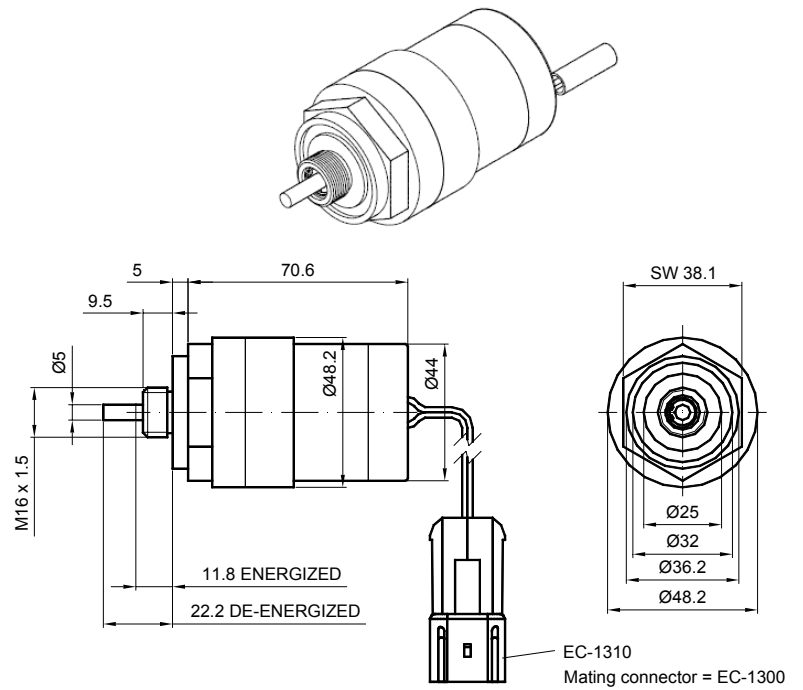


MITSUBISHI-S4L ALR-190-M05-XX



PERKINS-404

ALR-190-P04-XX



YANMAR-TNV Series

ALR-190-Y04-XX

