

GAC Application Note

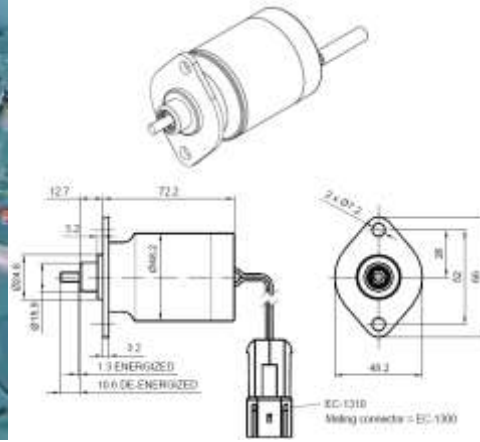
Document Title:	ALR SERIES LINEAR ACTUATORS
Customer / OEM:	KUBOTA, SHIBAURA, MITSUBISHI, FARYMANN, ISUZU, YANMAR, AND PERKINS
Application(s):	Power Generation, Agricultural, Construction, Industrial, Stationary Power
Engine Make / Model / Displacement / Rating:	See Application Chart below.
Equipment Make / Model:	Various
Fuel System Type & Make / Model:	Diesel: In-Line and Unit Pumps
Operating Speed(s):	1500 / 1800 RPM operating, 600 RPM idle, variable range from 1000-2400 RPM
Battery Voltage:	12 or 24V
Installed or Recommended Products:	Speed Controller with Light Force: ECC328, ESD2402 ESD5520, ESD5120, ESD5500-II, ESD5570, ESD2244-12/24 Actuator – ALR190 Series Magnetic Speed Pickup – Various
Summary / Details / Notes:	The ALR-190 Series Integral Actuator is designed to mount directly onto the injection pumps of small engines. No external linkage or brackets are required for installation.

When de-energized the ALR-190 Series 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.

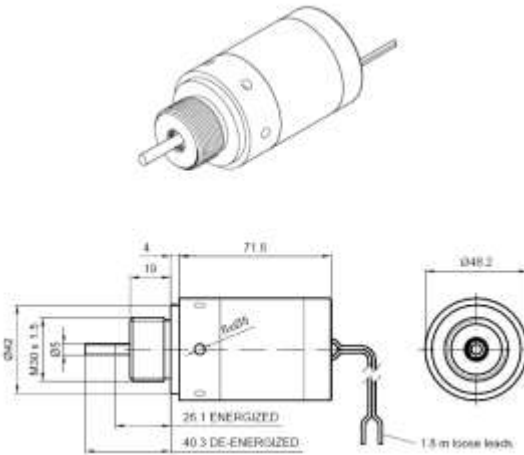
During installation the mechanical governor is set 200-300 rpm higher than the electric governor's operating speed. The mechanical governor acts as an over-speed protection and engine-power limiter, within the engine manufacturers specifications.

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

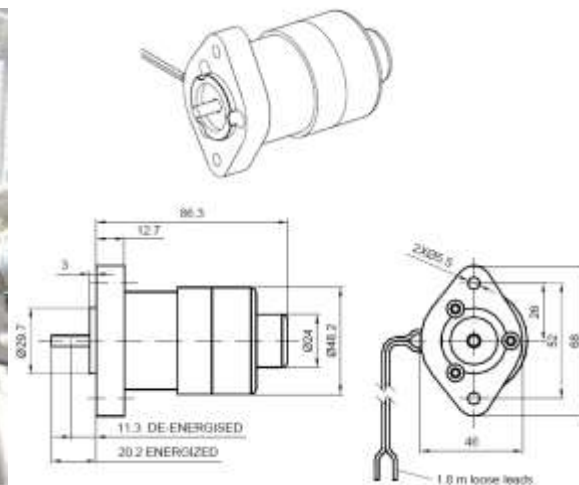
1 – KUBOTA: ALR190-K04-XX



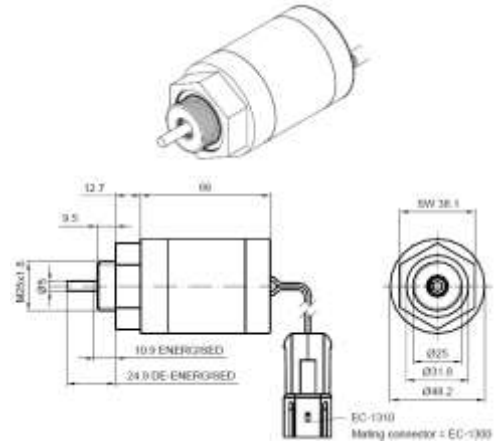
2 – MITSUBISHI ‘L’ AND ‘S’ SERIES ENGINES: ALR190-M04-XX



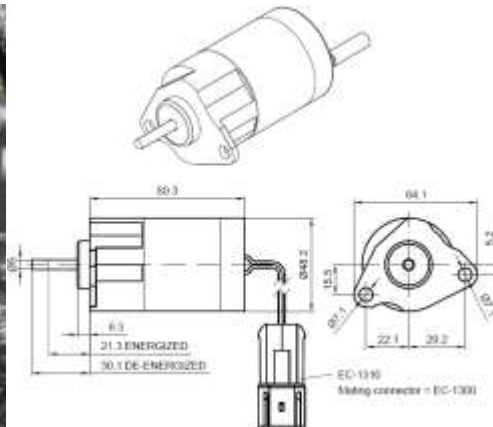
3 – FARYMANN 18 SERIES ENGINES: ALR190-F04-XX



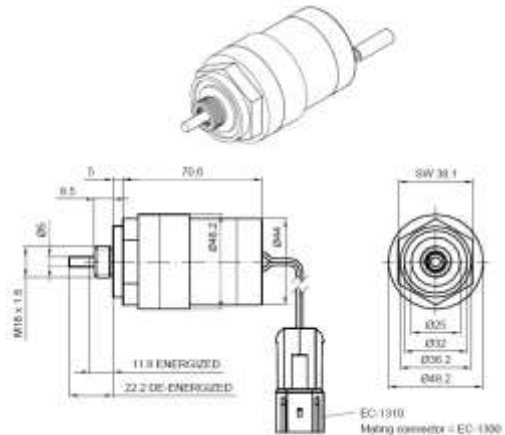
4 – ISUZU ‘C’ AND ‘L’ SERIES ENGINES: ALR190-I03-XX



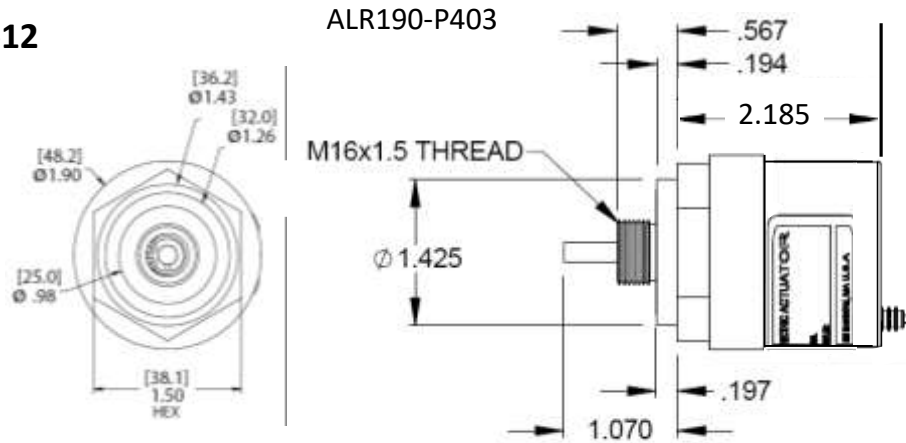
5 – YANMAR TNV SERIES ENGINES: ALR190-Y04-XX



6 – PERKINS 404 AND 403 SERIES ENGINES: ALR190-P04-XX



ALR190-P403-12



Application Chart – All Models

ENGINE FAMILY	ENGINE MODEL	ACTUATOR MODEL
ISUZU		
C-Series	2CA	ALR190-Y04-12 or -24
	3CA	
	3CB	
	3CD	
	3CE	
L-Series	3LB1	ALR190-I03-12 or -24
	3LD1	
	3LD2	
	4LE1	
	4LE2	
MITSUBISHI		
L-Series	L2E	ALR190-M04-12 or -24
	L3E	
S3L-Series	S3L	ALR190-M04-12 or -24
	S3L2	
	S4L	
	S4L2	

ENGINE FAMILY	ENGINE MODEL	ACTUATOR MODEL
FARYMANN		
Farymann	18W	ALR190-F05-12 or -24
KUBOTA		
Super 5 Series	D905	ALR190-K04-12 or -24
	D1005	
	D1105	
	D1105-T	
	V1305	
3300 Series	V3300	ALR190-K04-12 or -24
	V3600	
	V3600T	
	V3800	
Kubota	M03	ALR190-KM03-12 or -24
V Series	V2003	ALR190-KV03-12 or -24
	V2203	
	V2403	
V Series	V2607	ALR190-KV07-12 or -24
	V3007	
	V3307	

ENGINE FAMILY	ENGINE MODEL	ACTUATOR MODEL
YANMAR		
TNV- and TNE-Series	2TNV70	ALR190-Y04-12 or -24
	3TNV70	
	3TNV76	
	3TNV82A	
	3TNV84, 84T	
	3TNV88	
	4TNV84	
	4TNV94L	
	4TNV88	
	4TNV98, 98T	
	2TNE	
	3TNE	
	4TNE	
PERKINS		
Perkins	404	ALR190-P04-12 or -24
	700	
	403D-15	ALR190-P403-12 or -24
	N843-C	ALR160-S04-12, or -24
	N844L-C	
	N844LT-C	

Connector Types

ALR MODEL	CONNECTOR TYPE
ALR160-S03	Spade
ALR190-I03	Spade
ALR190-K03	Spade
ALR190-K04	Packard
ALR190-K24	Packard
ALR190-KV2403	Packard
ALR190-KV3073	Packard
ALR190-KV3307	Packard
ALR190-KV3600	Packard
ALR190-M04	Packard
ALR190-P04	Packard
ALR190-P403	Packard
ALR190-Y04	Packard