

# SERVOCONTROLS

Closing The Loop



## Servocontrols & Hydraulics (I) Pvt. Ltd.

An ISO -9001-2008 certified company & AS 9100-Rev C company

Website : [www.servocontrolsindia.com](http://www.servocontrolsindia.com)

### SERVOCONTROLS HYDRAULIC / ELECTROMECHANICAL ACTUATORS



### APPLICATIONS

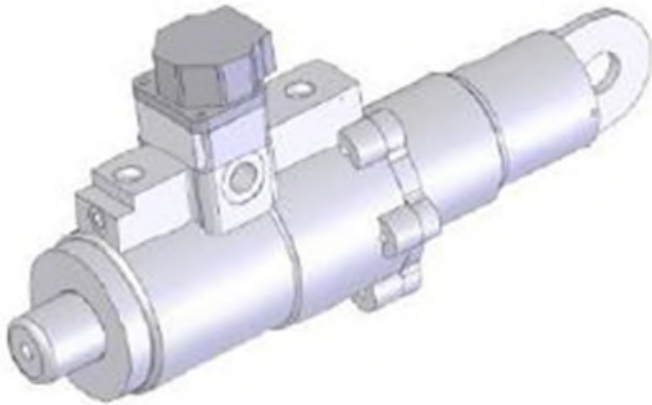
- ▶ Aerospace / Airworthy Actuators
- ▶ Fatigue / Hydraulic / Structural Testing
- ▶ Construction equipment
- ▶ Material handling equipment
- ▶ Steels Mills
- ▶ Paper Industry
- ▶ Power Generation/Turbine Servomotors
- ▶ Hydraulic Press brakes
- ▶ Motion Platforms & Entertainment
- ▶ Injection & Blow Molding

### IN HOUSE FACILITIES

- ▶ Inhouse Mechanical/Electronics/Electrical design departments.
- ▶ State of the Art 2/3/5/ axes machine Shop, Grinding /Honing & Laser Welding.
- ▶ Clean Room Facility for Hydraulics and Electromechanical Systems
- ▶ Assembly and Test Shop
- ▶ Fabrication and Paint Shop
- ▶ Metrology Lab
- ▶ Servo lab
- ▶ Servovalve / Proportional Valve & Sensor Repair Centre

**Special Hydraulic Cylinders**

**Special Airworthy Hydraulic Actuator**



SPECIFICATION		
1	Stall force	2 ton
2	Cylinder bore	50 mm
3	Rod dia	32 mm
4	Stroke	+ 25 mm
5	Operating Pressure	350 bar
6	Proof pressure	525 bar
7	Burst pressure	875 bar
8	Max speed	555 mm/sec
9	Null Length	315 +/-3 mm
11	Envelop Dimensions	125 x 350 mm
12	Body material	15-5 PH steel

**Hydraulic actuator for marine applications:**



Model No. : SC-05-211



Model No. : SC-05-156

**Description of Actuators :**

These Hydraulics actuators are used for marine applications. Material used : AB2PKM marine alloy steel.

**Liquid spring for high tonnage shock absorbers at 1200 bar**



Model No. : SC-09-146

**Description of Liquid Spring :**

This liquid spring is used to absorb shock for various application. It comprises of hi viscous fluid & set of orifices to get desired results working pressure : 1200 Bar

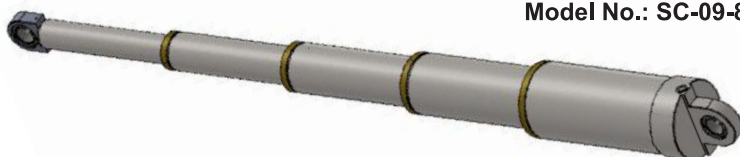
**Outrigger actuators**



Model No. : SC-07-107-404

OPERATING CONDITIONS :		
1	Max. Operating pressure	160 BAR
2	Test pressure	300 BAR FOR 3 MIN. EACH SIDE
3	Working Medium	MINERAL OIL
4	Operating Temp.	-20 deg. 100 deg. C
5	Type	Double Acting
6	Bore	140 mm
7	ROD	90 mm
8	Stroke	750 mm

**Telescopic Cylinder 4 Stage**

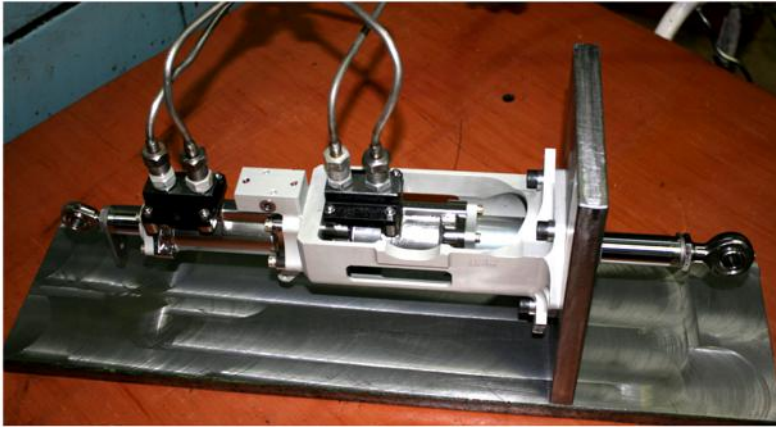


Model No.: SC-09-82400

SPECIFICATIONS		
1	Cyl Capacity	340 KN, 250 KN, 175 KN, 121 KN
2	Stroke	1540 MM TOTAL
3	Pressure working	275 Bar
4	Pressure max	300_Bar
5	Mounting	Eye end Sph Bearing

**Air worthy actuators Primary & Secondary Flight Control**

Development of Flight Control Airworthy Actuators and their precision parts (MRA)

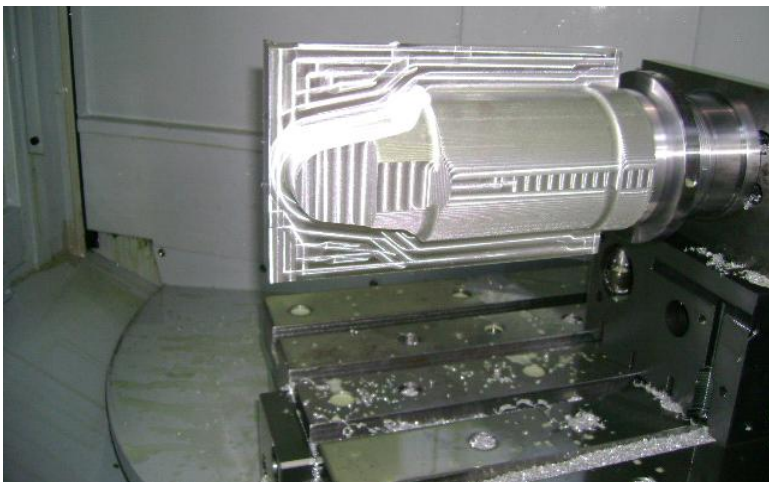


Hydraulic Multicylinder for Aircraft Arrestor Braking Systems designed and built inhouse

Development of Flight Control Airworthy Actuators and their precision parts for Helicopters (TRA)



Entire Aircraft Hub, brake systems, Landing Gear Actuator mfd at Servocontrols



Aircraft Engine Control Actuators under Machining (CIGV Actuator)



Mr. Avinash Chandar – SA to Raksha Mantri  
Mr. R K Thyagi – Chairman HAL  
felicitating our Mr. Shrinivas Mgr – Servocontrols for LCA's Esteem Vendor Award

## Fatigue testing

### SERVO ACTUATORS

#### Servo Actuators

Fatigue rated high frequency, low friction Servo actuators of capacity ranging from 1 T up to 100T with Servo valve, load cell (optional), inbuilt position sensor, Hydraulic power pack, Digital Motion controller and Data acquisition systems.



#### Servo actuator for fatigue test:

Model No. : SCA-280-160-100-280-RF

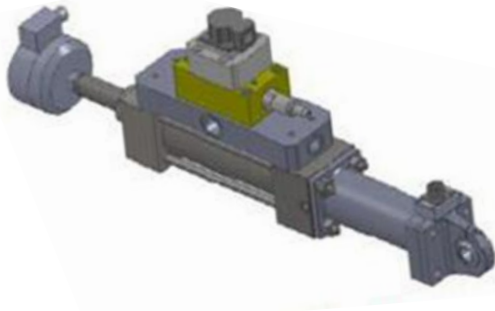
SPECIFICATIONS		
Sl No.	Description	Value
1	Capacity	3500 kgf (35kN)
2	Stroke	200 mm (+/-100mm)
3	Velocity Max	2mtr/sec & 3mtr/sec
4	Hyd Pressure	280 bar
5	Servo Valve	200 LPM @ 280 bar
6	LVDT	250 mm Internal



#### 10 kN Servo actuator

Model No. : SC-05-138-000

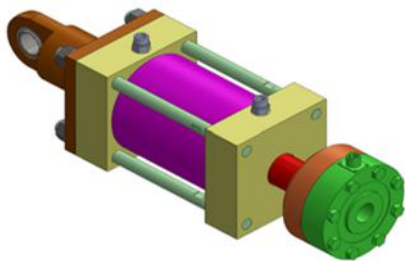
SPECIFICATION OF HAL 10 kn ACTUATORS		
1	Cyl capacity	+/- 10 kN @ 210 bar
2	Cylinder Bore	Ø 40 mm
3	Dbl ended Rod Dia	Ø 30 mm
4	Stroke	+/- 65 mm
5	End Cushion	15 mm
6	Load cell ten/comp	15 kN
7	Servo valve	38 LPM @ 70 bar High response
8	LVDT	130 mm stroke Builtin
9	Working Pressure	210 bar
10	Proof Pressure	310 bar
11	Mounting	Swivel Base swivel angle > ± 15°



#### 100 kN Servo actuator

Model No. : SC-09-259-00

SPECIFICATION		
1	Cyl Capacity	100 KN @ 100 BAR
2	Cylinder Bore	Ø 125 mm
3	Piston Rod Dia	Ø 50 mm (Double Ended)
4	Stroke	(+/-) 50 mm (100 Total)
5	Cushion length	10 mm both sides
6	Pressure working	100 Bar
7	pressure max	220 Bar
8	Mounting	Eye end Sph Bearing
9	Hydraulic Oil	MIL 5606 G



#### Hi frequency servo actuator :

Model No. : SCA-140-80-15-210-FF

SPECIFICATIONS		
1	Cylinder bore	140 mm
2	Rod dia Dbl ended	80 mm
3	Stroke	±15 mm
4	Operating Pressure	210 bar
5	Force developed	110 kN
6	Amplitude	0.5 mm
7	Frequency of oprn	100 Hz



## Fatigue Rated Servo Actuators



- SCA** : Servo Control Actuator
- BD** : Bore dia in mm/ Inches
- RD** : Rod dia in mm/ Inches
- STK** : Stroke in mm/ Inches PK
- PR** : Pressure in Bar / KIP
- T** : Tonnage in KV
- M** : Mounting
- MF** : Mounting Flange
- FF** : Front Flange
- RF** : Rear Flange
- MT** : MID Trunium
- RT** : Rear Trunium
- FT** : Front Trunium
- RE** : Rod Eye
- BRE** : Both end Rod eye

**Selection Code: SCA-BD-RD-STK-PR-T-M**

SL NO.	Piston Rod OD in Inches	Cylinder ID in Inches	Compression in (kip)	Stroke Length in Inches
1	1.75	2.5	14.2	10
2	1.75	2.5	14.2	20
3	1.75	2.5	14.2	30
4	1.75	2.5	14.2	40
5	2	3.25	24	10
6	2	3.25	24	20
7	2	3.25	24	30
8	2	3.25	24	40
9	2.5	4	37	10
10	2.5	4	37	20
11	2.5	4	37	30
12	2.5	4	37	40
13	3	5	57	10
14	3	5	57	20
15	3	5	57	30
16	3	5	57	40
17	4.5	8	146	10
18	4.5	8	146	20
19	4.5	8	146	30
20	4.5	8	146	40

SL NO.	Piston Rod OD in mm	Cylinder ID in mm	Compression in (kN) at 200 bar	Stroke Length in mm
1	45	63	62	250
2	45	63	62	500
3	45	63	62	750
4	45	63	62	1000
5	50	80	100	250
6	50	80	100	500
7	50	80	100	750
8	50	80	100	1000
9	63	100	157	250
10	63	100	157	500
11	63	100	157	750
12	63	100	157	1000
13	75	125	245	250
14	75	125	245	500
15	75	125	245	750
16	75	125	245	1000
17	115	200	628	250
18	115	200	628	500
19	115	200	628	750
20	115	200	628	1000

## Fatigue Rated Actuator for automotive and aerospace structural testing

Servocontrols group of companies manufacture various types of actuators. These are fatigue rated force generators designed for long stroke and/or low dynamic applications. Compatible with LVDT feedback and control components, these actuators provide precise performance ideal for frequency test and simulation applications.

These are flexible enough to meet all your force and motion control needs, these actuators are available in different force ratings, both in standard lengths and made to order custom lengths. Servocontrols actuators are designed for superior responsiveness and reliability.

Our actuator design incorporates high and low pressure seals and a drain arrangement rarely found on other make products. These features provide lower friction and control oil leaks. Nonmetallic bearing provide side load tolerance and greated resistance to galling therefore extend operational life.

### MED Frequence Actuator 3 stage



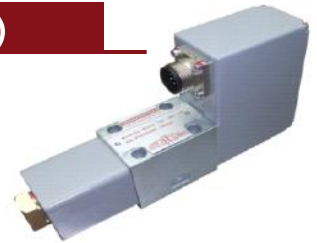
SPECIFICATION		
1	Cylinder Bore Dia	63 mm
2	Double Ended Rd Dia	32 mm
3	Stroke	+/- 40 mm +/-0.3 mm
4	Port Connection	1/2" BSP
5	Operating Pressure	210 bar
6	Frequency	0 - 35 Hz @ +3MM
7	Linear Speed	35 mm / sec



High End Fatigue Rated Servoactuators for Endurance/Life cycle testing application of aircraft components

**SERVOCONTROLS HIGH RESPONSE DIRECT DRIVE VALVE (DDV)**

Servocontrols offer high response direct drive valve with electronic closed loop spool position control. These valve are available with flow capacity ranging from 1LPM up to 100 LPM @ pressure drop of 70 bar.



**SERVO VALVES FOR STEEL MILLS/ POWER GENERATION INDUSTRIES / TEST APPLICATIONS AND OTHERS**

Model Code	Nominal flow at 70 bar (lpm)
SC550-101	4
SC550-102	10
SC550-103	20
SC550-104	40
SC550-105	60
SC550-106	75



**SERVO VALVE MODEL 890**

4-Port Configuration – 50.9mm PCD  
2 stage mechanical feedback  
High flow Electrohydraulic Servo valve

Model Code	Nominal flow at 70 bar (lpm)
SC890-101	95
SC890-102	150
SC890-103	230



**SERVICING OF SERVO VALVES AND TEMPOSONIC SENSOR**

**World Class Servo valve Repair, Assembly, Test Lab**

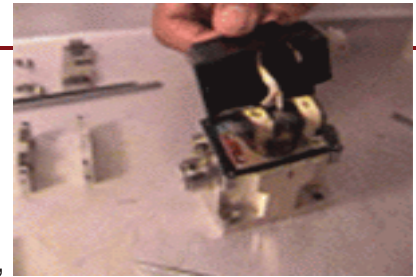
We have huge inventory of Servo Valves , Tube Filters, Cartridge Filters, Disc Filters, Last Chance Filters, Torque Motors, Seal Kits, O-Ring Sets, Connectors, Coils & Electronic Cards. We Repair/ service Proportional, Servo Proportional & Servo valves.

**All Brands, All Types, All Configurations**

Abex, Atchely, Cincinnati, Dowty, Dyval, EMG, Herion, Hydromatic, Kawasaki, LHC, Moog, Star, Oilgear, Olsen, Parker, Pegauses, Plasser, Rexroth-Bosch, Shnieder, Sopelem, Towler, TSS, Ultra, Vickers

**Servicing of Temposonic Sensors.**

We have dedicated Electronics lab with all necessary instrumentation and inventories for Servicing Temposonic position sensors.



Servo valve Servicing



Temposonic Servicing

**CLOSED LOOP MOTION CONTROL SYSTEMS**

Real time Motion controller and system from single axis up to 32 axes including custom control algorithms and software development



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## Positing sensors (0.5micron response) RP / RH ORDERING CODE FOR SSI SENSOR

### R-Series SSI

Temposonics®

**Sensor model**

**RP**- Profile  
**RH**- Rod

**Design**

**Profile Temposonics® RP:**

**S**- Magnet slider, joint at top  
**V**- Magnet slider, joint at front  
**G**- Magnet slider, joint at top, backlash free  
**M**- U-magnet, OD33

**Rod Temposonics® RH:**

**M**- Flange M18 x 1.5 (Standard)  
**V**- Flange M18 x 1.5 (Fluorelastomer housing-seal)  
**D**- Flange M18 x 1.5 with bushing on rod end  
**R**- Flange M18 x 1.5 with thread M4 at rod end  
**J**- Flange M22 x 1.5, rod Ø 12.7 mm, 800 bar  
**S**- Flange ¾" - 16 UNF - 3A

**Stroke length**

**Profile**- 0025...5000 mm  
**Rod**- 0025...7600 mm  
Standard: See chart  
Other length upon request.

**Connection type**

**D70**- 7 pin male receptacle M16  
**P02**- 2 m PUR-cable w/o connector, option: P01 - P10 (1 - 10 m)

**Supply voltage / Conditions of use**

**1**- +24 VDC  
**A**- +24 VDC / vibration resistant (stroke length 25...2000 mm)

**Output**

**S [1][2][3][4][5][6][7][8][9]**= Synchronous Serial Interface

**[1]**Data length:                   **1**- 25 bit • **2**- 24 bit • **3**- 26 bit  
**[2]**Output format                   **B**- Binary • **G**- Gray  
**[3]**Resolution (mm):               **1**- 0.005 • **2**- 0.01 • **3**- 0.05 • **4**- 0.1 • **5**- 0.02 • **6**- 0.002 • **8**- 0.001 • **9**- 0.0005  
**[4]**Performance:                   **1**- Standard • **8**- Noise reduction filter (8 values) • **D**- No filter + error delay 10 cycles  
  **G**- Noise reduction filter (8 values) + error delay 10 cycles • **K**- Peak reduction filter (8 values)  
  **N**- Peak reduction filter (8 values) + error delay 10 cycles  
**[5][6]**Signal options:               **00**- Measuring direction forward  
  **01**- Measuring direction reverse  
  **02**- Measuring direction forward, synchronised measurement  
  **05**- Measuring direction forward, Bit 25 = Alarm, Bit 26 = Parity even  
  **16**- Measuring direction forward, internal linearization  
  **99**- for optional further combinations (use next fields**[7],[8],[9]**)

**[7]**Measurement contents       **1**- Position • **2**- Differential • **3**- Velocity • **4**- Position + temperature (only with data length = 24 bit)  
  **5**- Differential + temperature (only with data length = 24 bit) • **6**- Velocity + temperature (only with data length = 24 bit)  
**[8]**Direction and sync. mode   **1**- Forward async • **2**- Forward sync1 • **3**- Forward sync2 • **4**- Forward sync3       • **5**- Reverse async • **6**- Reverse sync1  
  **7**- Reverse sync2 • **8**- Reverse sync3

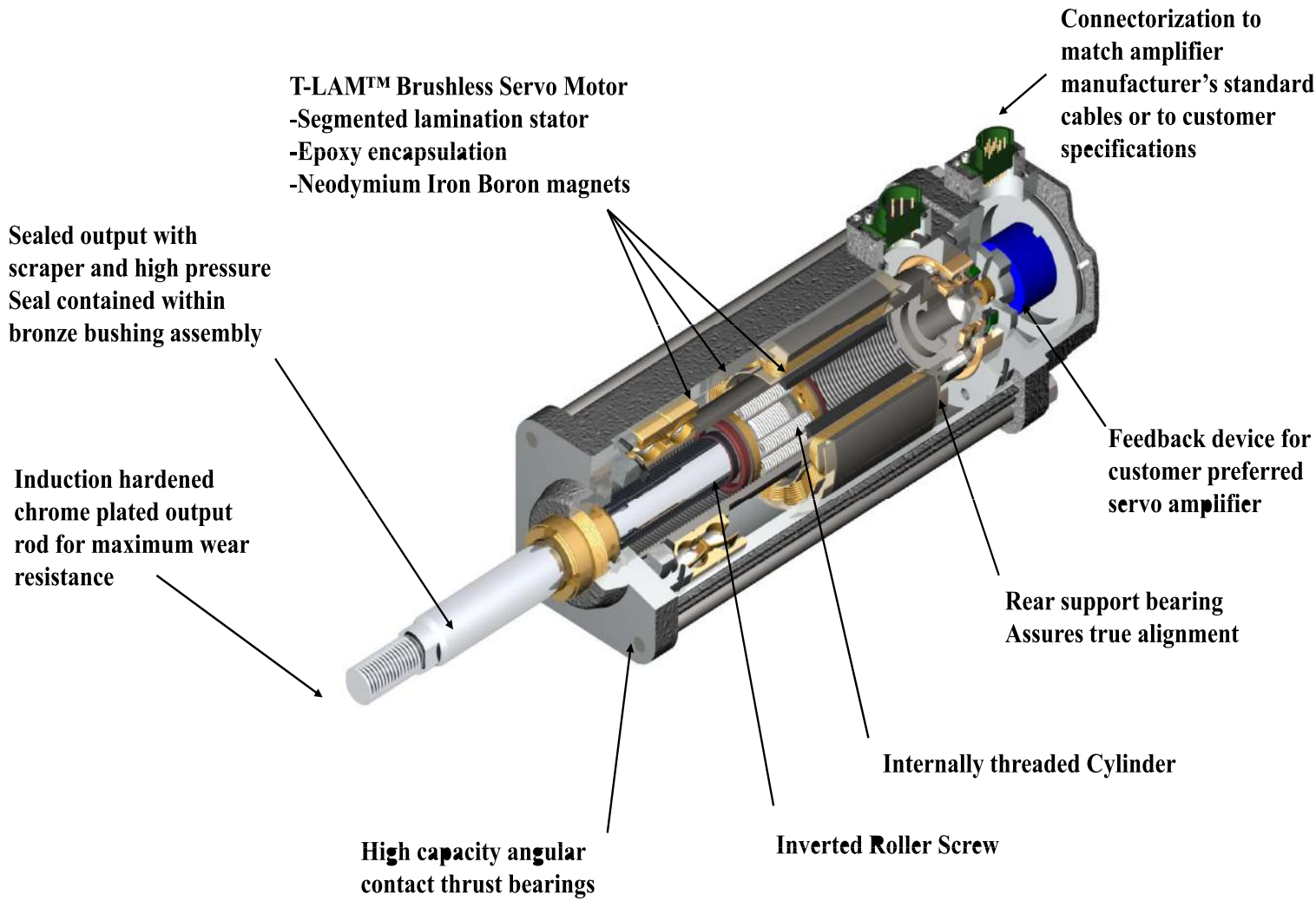
**[9]**Internal linearization & communication diagnostics   **0**- No further option • **1**- Linearity Correction Option • **2**- Additional alarm bit + parity even bit (not available for temperature output, only data length 26 bit) • **4**- Additional alarm bit + parity even bit and Linearity Correction Option (not available for temperature output, only data length 26 bit)

**Included in delivery profile model:**Sensor, position magnet, 2 mounting clamps up to 1250 mm + 1 clamp for every additional 500 mm.

**Included in delivery rod model:**Sensor and O-ring. Magnets must be ordered separately. Use signed magnets for sensors w/LCO



**Linear Electromechanical Actuators  
(Rotary & Linear) (Rollers Screw / Ball Screw / Acme Screw)**



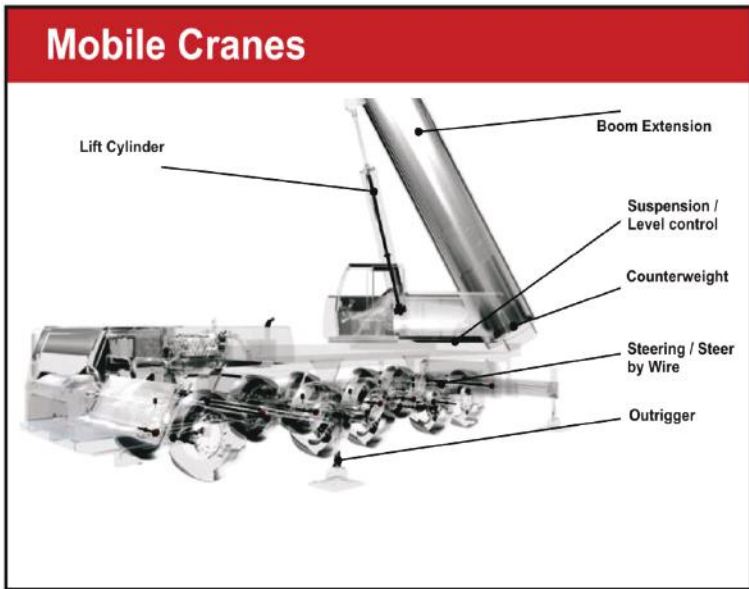
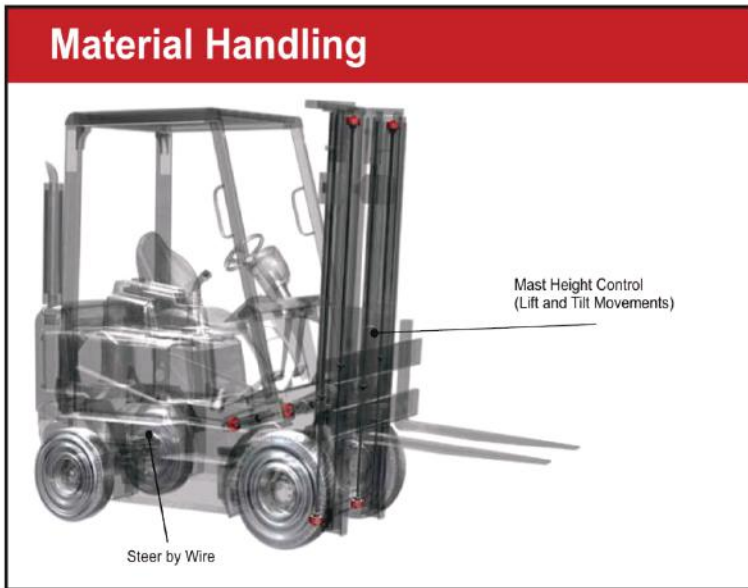
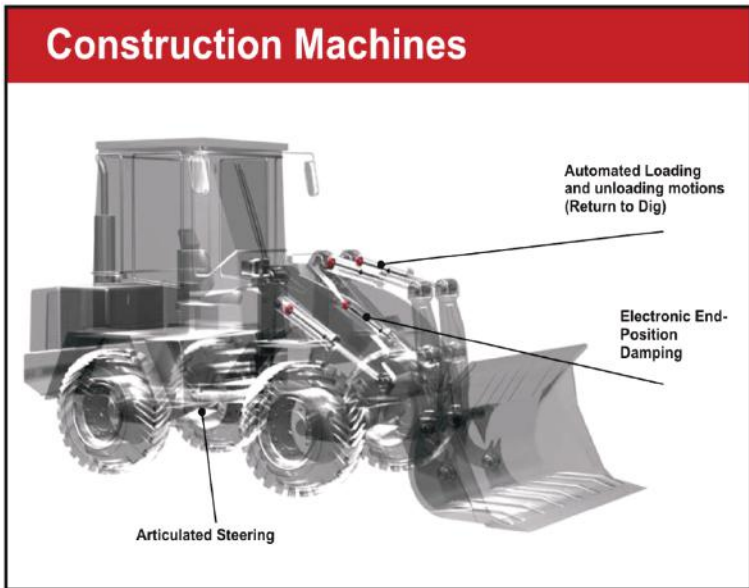
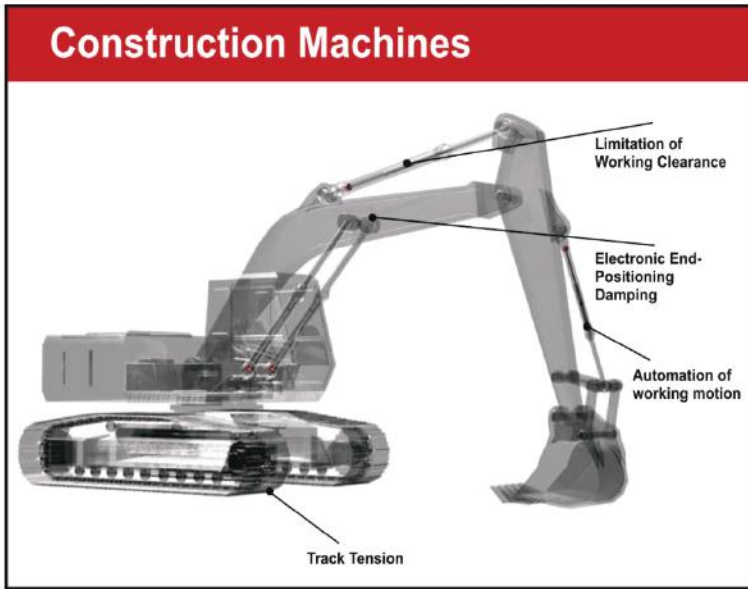
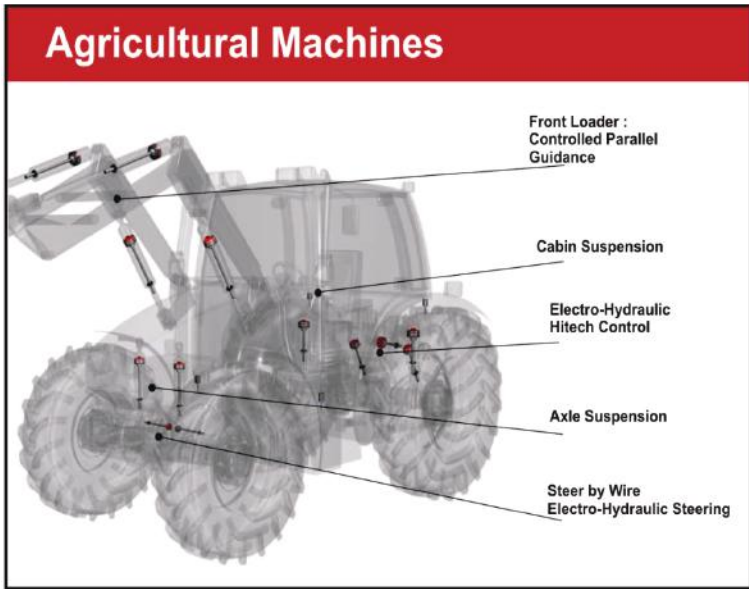
**FATIGUE RATED ELECTROMECHANICAL ACTUATORS WITH BALLS SCREWS/ROLLERS SCREWS/ACHME SCREWS**

Fatigue rated Electromechanical actuators with inbuilt load cell. SERVOCONTROLS linear actuators combine the advantages of roller screw technology and T-LAM stator technology to create a powerful and robust linear solution. These actuators uses a specially designed roller screw mechanism for converting electric motor power into linear motion within the actuator.

These actuators are provided with an integrated load cell for force measuring capability. This option offers a convenient method for obtaining electronic data relating to the force being applied by the actuator. The load cell is a strain gauge type, offering you stable and accurate load sensing in both the tension and compression directions, and for static or dynamic loads. The packaging of the strain gauges are integral to the actuator's housing, offering a compact, protected robust design



# Mobile hydraulic cylinders for construction applications and material handling



### Advantages with intelligent Sensors

**Increased Productivity of mobile machines**  
- more efficient thanks to innovative sensor technology

**Cost reduction**  
- reduced wear thanks to electronic end position damping  
- higher availability due to less shut down  
- reduced maintenance efforts based on non contact sensing  
- reduced fuel consumption due to precised closed loop circuits

**Easy handling of the machine**  
- based on automated operating motion sequences at the push of a button

**Safety**  
- meet new safety standards (IEC 61508)

**Comfort**  
- less physical stress for the engine operator

# Mobile Hydraulic Sensors and its Markets

## 1. MTS Sensors

Tradition, Experience, Innovation. Pioneer of magnetostrictive Linear Measurement and Technology Leader.

## 2. Mobile Hydraulic Machines Market Requirements

- Increase the Machine's Productivity
- Reduce fuel Consumption and Emission
- Reduce the Costs on Design & System Solution
- Safety for Operator and Environment
- Comfort for Machine Operator



## 3. Sensors for Mobile Hydraulics



**Safe installation inside the hydraulic cylinder**

Embedded Sensors for In-Cylinder Design  
 Protection of the sensor by the cylinder housing  
 resistant against ambient conditions  
 (Water, Dirt, EMC, Shock & Vibration)

**SIL2 rated sensors**

relevant for all safety related systems acc. to IEC 61508



MH  $\phi$  48 mm  
 Standard flange design  
 Analog and digital outputs  
 20g r.m.s.(20.....2.000 Hz)



MS  $\phi$  28 mm  
 Small, compact design  
 Analog outputs  
 15 g r.m.s.(20.....2.000 Hz)



MS  $\phi$  48 mm  
 Redundant version  
 2 individual analog outputs  
 10 g r.m.s.(20.....2.000 Hz)

## Reliable Sensor-Installation & Application

### Benefits to OEM:

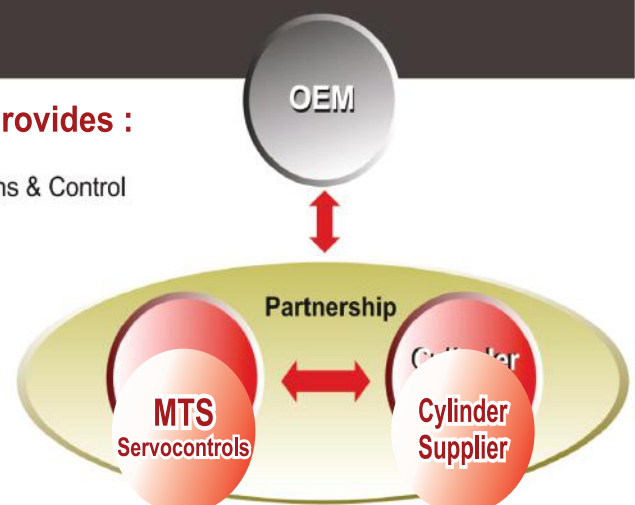
- Integrated In-cylinder solution
- Cylinder-sensor package supplier
- Package price
- High quality- reliability

### MTS / Servocontrols provides :

- Sensor Technology
- Knowledge about Applications & Control Systems
- Technology trends
- Service & Support

### Benefits from cylinder supplier:

- Knowledge about design and assembly
- Safe product handling Sensor installation and processing



**Note : We can provide sensor installation service to standard cylinders by gun drilling**

# SERVOCONTROLS

Closing The Loop

SERVOCONTROLS 100% EOU unit in 12 acres of land near Hattargi Belgaum Special economy Zone

Address for Correspondence:

## Servocontrols & Hydraulics (I) Pvt. Ltd.

(An ISO 9001-2008 & AS 9100 Rev C Certified Company)

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Our MD Deepak Dhadoti Receiving best entrepreneur award from Nobel Lauret Kailash Satyarthi & Narayan Murthy at TIECON (2015)



Industrial Jewel Award (2011)

ISO -9001-2008

AS 9100-Rev C company



SERVOCONS

