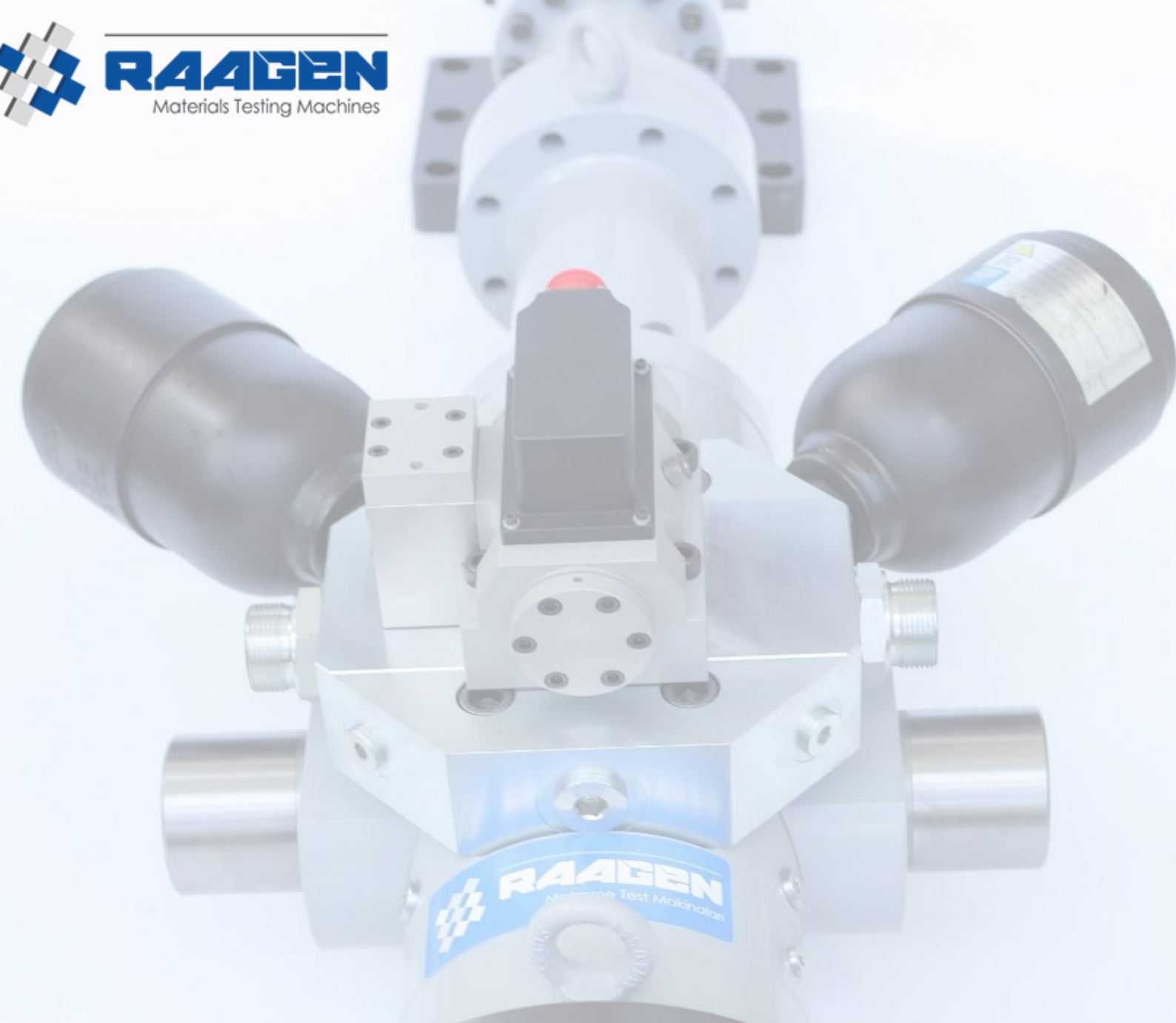
RAAGEN
Materials Testing Machines




# HDA-S SERIES HYDROSTATIC ACTUATORS

**General Information:**

Raagen offers advanced solutions for all varieties of materials testing, including monotonic and cyclic testing. Backed by more than 10 years of experience, Raagen provides the technology and the specialized expertise to perform accurate, repeatable tests that ensure materials and components meet standards. These complete solutions include:

Highly stiff, floor-standing servo-hydraulic load frames for a range of force requirements

Test benches to achive custom design tests for construction, automotive and rail materials.

Aplicable, versatile and user-friendly software with powerful test design capabilities

Digital controllers with high channel density, high capacity and superior configurability

Rugged, high-performance grips and fixtures

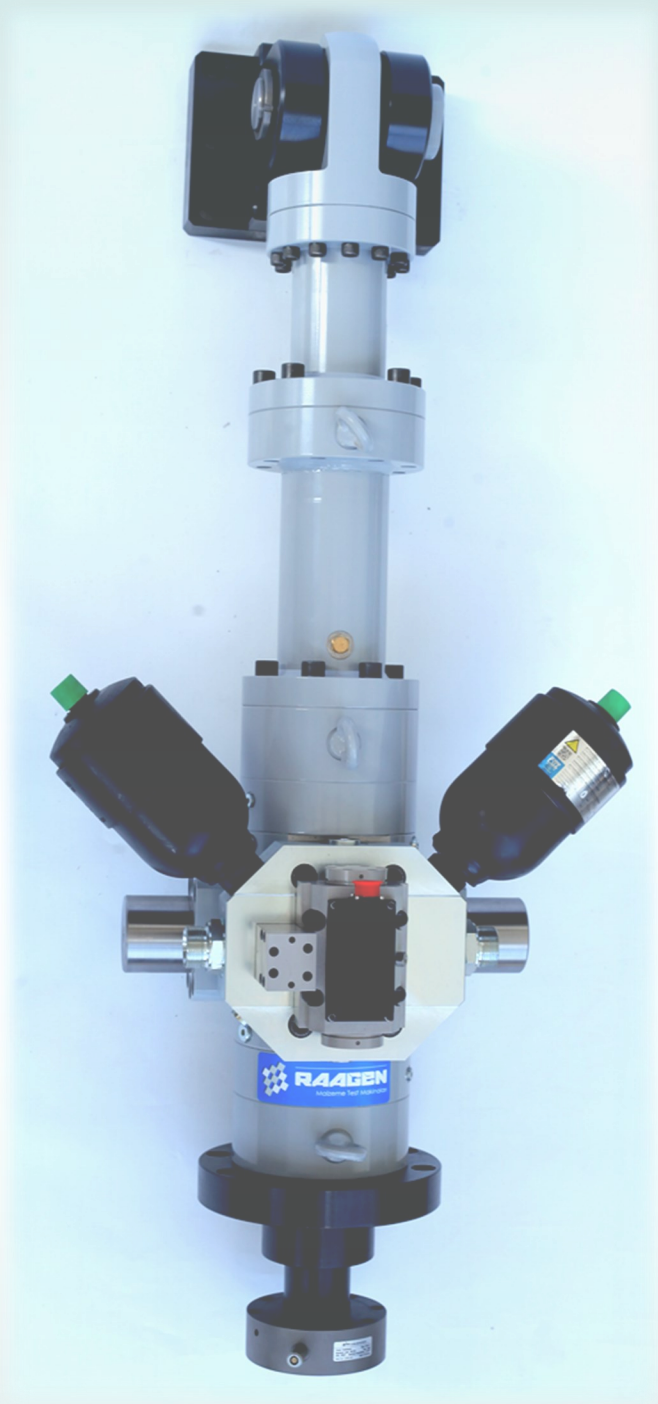
**Overview:**

Raagen Hydrostatic Actuators are the workhorse of any laboratory and facility. They can perform a wide variety of low and high cycle fatigue, crack propagation, fracture toughness, contruction,seismic and other dynamic test applications. Each system can be readily configured with appropriate sized servo valves, manifolds and hydraulic power unit to suit the particular application. All systems are equipped with the advanced features of the “DOLI” (Made in Germany) digital controller, console Software and unique fatigue-rated load cells. Test&Motion™ Dynpack dynamic testing software provides the backbone for running many dynamic tests. Other applications specific software module allows other standardized tests to be run. These dynamic systems, when combined with Test&Motion™ and appropriate accessories, are ideal for also running a variety of static tensile, compression, flexure, peel, tear and friction tests.

# HDA-500-S HYDROSTATIC DYNAMIC ACTUATORS

**FEATURES**

- Raagen Hydrostatic Actuators are using for precise control of high-frequency motions and forces.
- Series HDA-S are double-ended, linear force generating actuators that operate under precision servovalve control.
- The Actuators are designed specifically as low friction, low distortion, high sideload for dynamic testing of structures and components.
- Hydrostatic pressure-centering bearings are existing for continuous high speed operation under heavy side loaded conditions..
- Large-diameter, single-piece, chrome-plated piston rod provides strength and lateral stiffness.
- These actuators feature fatigue-rated designs to exceed rated loads for millions of cycles. You can expect highly reliable performance over a long functional life, helping to maximize your uptime and minimize total cost of ownership.




◊ DTM-500-S's are ±500 kN force capacity, low friction double ended hydrostatic dynamic actuators.

◊ The actuators are working as closed loope controlled system

◊ They designed for both dynamic and static testing on a variety of materials and components

◊ The actuators are hysteresis-free in quasi-static and dynamic operation over the full displacement and force range.

◊ That is free of mechanical seals, friction and wear. This allows continuous operation with minimal downtime and maintenance. The hydrostatic bearing allows the cylinder to react very high transverse loads that often occur in structural testing applications and

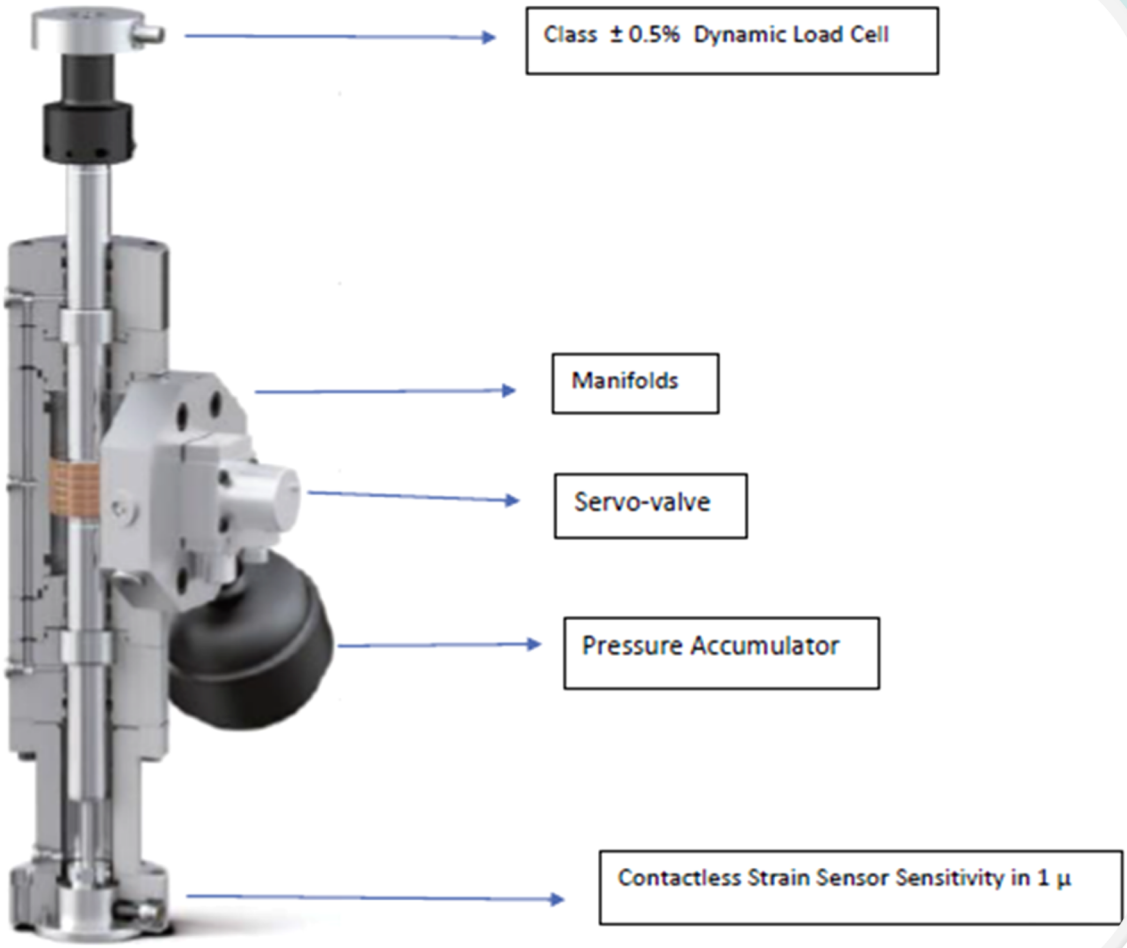
◊ Actuator frame design allows easy set up to laboratory areas and different test benches.

◊ Designed to be used with the Raagen Hydraulic Power Units or other brands HPU's.

◊ Compatible with a large range of grips, fixtures, chambers, strain gauges and other accessories.

◊ ***Content of Hydrostatic Actuator Systems:***

* High technology fatigue rated loadcell that has high accuracy from 0,01% to %0,5.
* High reponse or very high response servo valves with suitable flow rates of HPU's.
* High precson position measurement sensors.


Class ± 0.5% Dynamic Load Cell
Manifolds
Servo-valve
Pressure Accumulator
Contactless Strain Sensor Sensitivity in 1 µ

RAMEN
Malzeme Test Makinaları

## TECHNICAL DETAILS

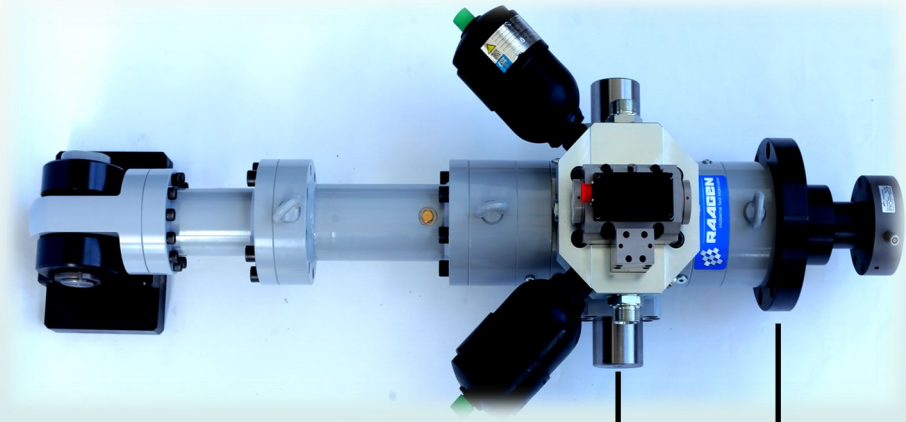
# Actuator Datas

| | |
|---|---|
| Force Capacity | ± 500 kN |
| Hydraulic Cylinder Effective Stroke | 150 mm |
| Series | HDA-S Series |
| Bore Ø | 215 mm |
| Rod Ø | 125 mm |
| Cylinder Stroke | 180 mm |
| Type Of Effect | Double Rod |
| Sealing System Between Piston and Cylinder | Step Sealing Ring |
| Sealing System Between Piston Rod and End Cover | Glyd ring |
| Guiding System | Wear Rings |
| Quality of Piston Rod | 42CrMo4 Hard-Chrome Plated |
| Hydraulic Port | For Mounting Plate |
| Position Transducer | MTS Temposonic RH Series |
| Working Area | 24033 mm² |
| Temperature Min | -15,0 °C |
| Temperature Max | 100,0 °C |
| Working Frequency | 30 Hz |
| Flow Rate | 110 mm/min |
| Total Weight | ~ 1200 kg |
| Mounting Cylinder Body | Basic Mointing, Intermediate trunnion, Swivels (Back and Front) |
| Accumulator Prestressing for port P | 130 bar |
| Accumulator Prestressing for port T | 20 bar |

## ACTUATOR CONNECTION TYPES

Raagen HDA-S Series hydrostatic actuators deliver with connection fixtures and adapters according to application type.

These connection interfaces are summarized in the following headings:




Intermediate Trunnion

Flange Connection

Swivel Connection

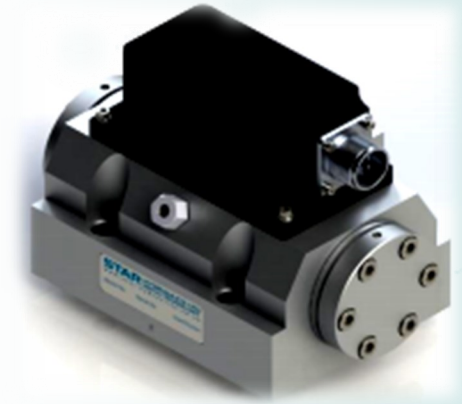
# ACTUATOR SYSTEM COMPONENTS

## GTM SERİES K FATIGUE RATED LOADCELL

| Nominal Force | kN | 500 |
|---|---|---|
| Accuracy Class | | 0,03 |
| Force Measurement Range | % | 1-100 |
| Linearity Error | % | 0,03 |
| Interpolation Error | % | 0,04 |
| Hysteresis | % | 0,05 |
| Repeatability (F.S) | % | 0,003 |
| Lateral Force Effect | %0,1 Fnom | 0,02 |
| Force Limit | % | 150 |
| Lateral Force Limit | % | 100 |
| Rated Characteristic Value | mV/V | 2 |

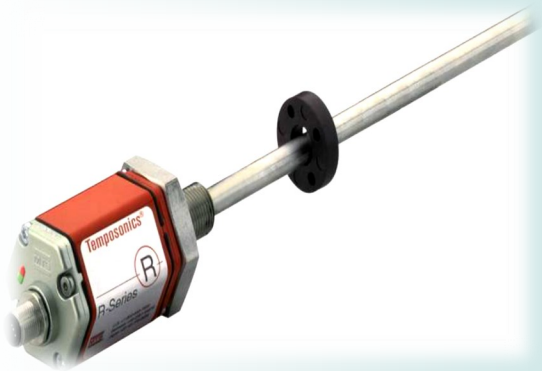
## STAR HYDRAULICS 890 2-STAGE SERVOVALVE RATED FLOW 150 L/MIN

| Nominal flow ratings | l/m | 150 |
|---|---|---|
| Operating pressure (max) | bar | 210 |
| Seal material | | EPDM |
| Hysteresis | % | ≤ 4.0 without dither |
| Threshold | % | ≤ 1.5 without dither |
| Internal leakage | l/m | ≤ 4.0 |
| Response time | ms | 18 |
| Temperature range | °C | -30 to 135 |
| Rated input | | ± (mA) |



## MTS TEMPOSONİCS MAGNETOSTRİCTİVE, ABSOLUTE, NON-CONTACT LİNEAR-POSİTİON SENSORS R-SERİES MODELS RH

| Resolution: | 1 µm |
|---|---|
| Linearity deviation: | < ± 0.01% full stroke |
| Repeatability: | < ± 0.001% full stroke (minimum ± 2.5 µm) |
| Hysteresis: | < 4 µm (2 µm is typical) |
| Outputs: | Synchronous Serial Interface (SSI)<br>(RS-422 type differential signal pairs) |
| Stroke length | 150 mm |
| Operating voltage: | +24 Vdc nominal: -15% or +20% *<br>Polarity protection: up to -30 Vdc<br>Overvoltage protection: up to 36 Vdc<br>Current drain: 100 mA typical<br>Dielectric withstand voltage:<br>500 Vdc (DC ground to machine ground) |
| Operating conditions: | Operating temperature:<br>-40 °C (-40 °F) to +75 °C (+167 °F)<br>Relative humidity: 90% no condensation<br>Temperature coefficient: < 15 ppm/ °C |
| Connection type: | 7-pin male D70 (M16) connector, 10-pin male MS connector or integral cable |
| Magnet types: | Ring magnet, open-ring magnet, or magnet float |



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