



Electric Actuators **ST RANGE**

**YOUR INDUSTRIAL APPLICATION
DESERVES**

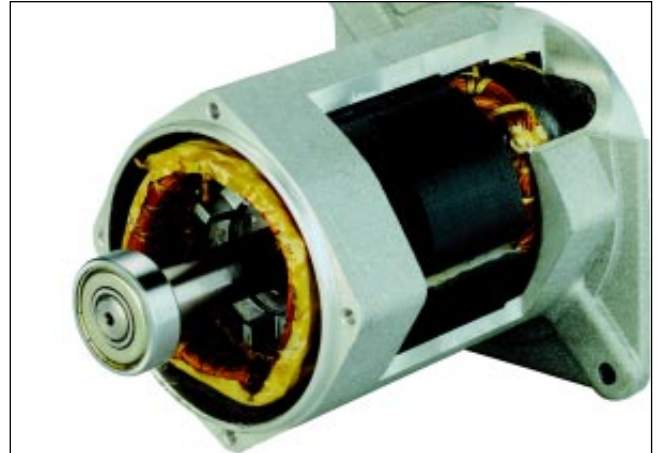
**THE RELIABILITY
OF
TRADITIONAL
ACTUATORS**

combined
with

**THE USER FRIENDLINESS
OF
21st CENTURY
TECHNOLOGY**



THE NEW ST RANGE



More than **50 YEARS** in the service of **PROCESS INDUSTRIES** have taught us how severe this environment can be and how important the commissioning phase is.

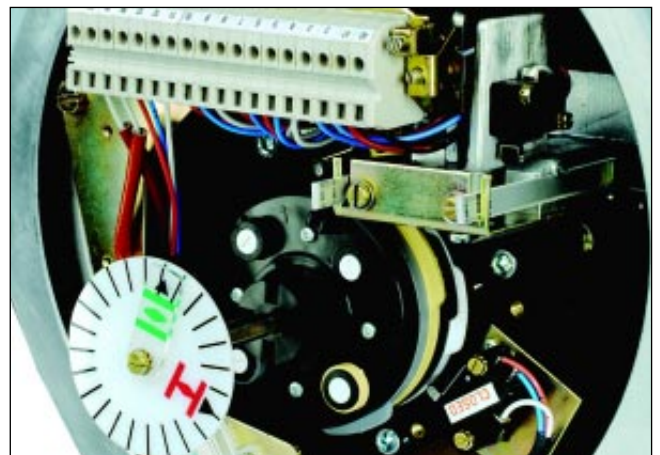
In designing the new ST Range **BERNARD** has drawn on their half century experience to offer you the best combination between :

— The **DEPENDABILITY** of electromechanical components like :

- Asynchronous motors
- Spring loaded torque sensors

— The comfort & flexibility of **USER-ORIENTED PROGRAMMABLE ELECTRONIC CONTROLS.**

— The tremendous increase in interactive **COMMUNICATIONS** offered by **INDUSTRIAL FIELDBUSES.**



DEPENDABLE PERFORMANCE

For extra power

1 ASYNCHRONOUS MOTORS

- Offering the highest ratio of starting torque vs. nominal torque.
- Designed for repetitive starts under full load at 360 starts/hour in ON-OFF service and up to 1200 starts/hour in MODULATING class III service.

For trouble free operation

2 TRANSMISSION GEARS

- Heavy duty oversized transmission without any clutch type device (except ST6). Full motor power drives the valve without any interruption in the power drive.

For accurate information

3 4 POSITION & TORQUE SENSORS

- Measure directly and proportionally :
 - valve travel
 - torque output
- The valve travel is measured through a mechanical link with the output shaft.
- The torque is measured by a dynamometric balance set at actuator output. In this way the control system is informed instantaneously of the actual torque transmitted to the valve. There is no interpretation of second hand data.
- In the **INTELLI+** version, both information are converted by use of contactless **ABSOLUTE ENCODERS**. In this way, even in case of a power shortage there is no risk of losing the position. Therefore there is no need for a battery backup.

For the protection of your investment

5 ENCLOSURES

- Enclosures are watertight to IP68 & NEMA 6 which means they are able to withstand to the pressure of 5 m for 72 hours.
- For explosive atmospheres, our actuators have received the qualification for the highest protection level :
 - CENELEC EEx d II CT 4 to 6
 - NEMA 7
- For the protection of the electronics, the control compartment of the actuator is completely isolated from the wiring compartment and local control is performed without intrusion into the control chamber.



6	Handwheel
7	Logic board
8	Positioner board
9	Fieldbus
10	interactive communication

USER FRIENDLY SERVICE

For operator convenience

6 MANUAL OPERATION

- The **DIFFERENTIAL GEARING** of the actuator lets you move the handwheel without any clutch action (except for very low torques as ST6). The handwheel is totally independant from the motor and the motor has always the priority over the handwheel.
- The choice of reduction for the handwheel is coherent with the torques : from 1:1 for low torques to 2:1 and more for higher torques.

For the comfort of all : Planers & Users

7 INTEGRAL+ LOGIC

- It allows a choice among a wide variety of operating modes (including ESD). In addition the choice of modes is possible at any time even after initial commissioning.

For performant process control

8 GAM POSITIONER

- It presents all the advantages of point of control feedback and ease of commissioning.

For wiring simplicity

9 BUS SYSTEMS

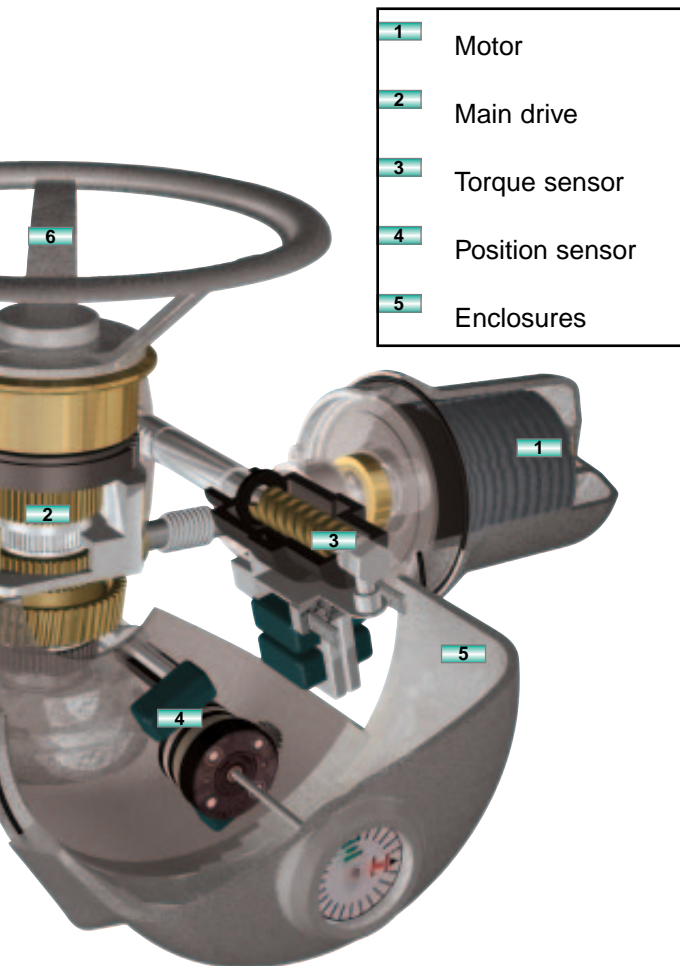
- It offers the ideal mean of communication allowing a cost savings on installation and takes full advantage of the very high level of information offered by **INTELLI+** versions.

and

For up to date communicability, safety and full diagnostics capabilities

10 INTELLI+ VERSION

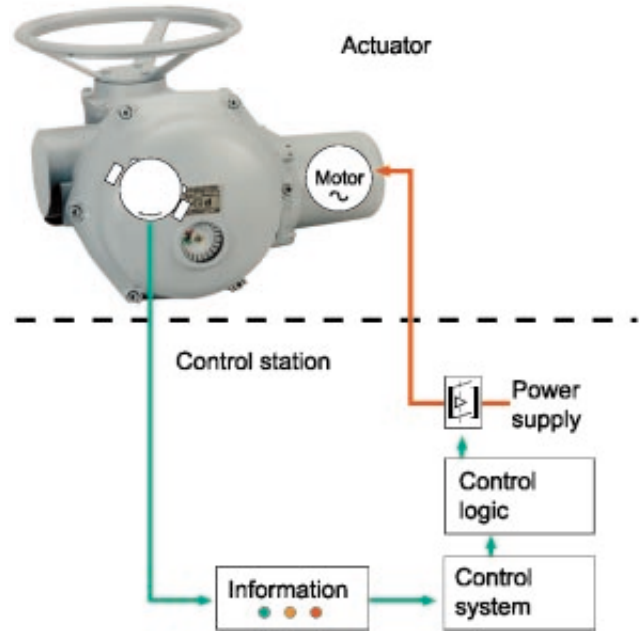
- will offer :
 - non intrusive settings
 - interactive communication
 - intelligent monitoring of your process
 - local & remote diagnostics capabilities



Depending on the characteristics of your process and of the actuators environment, you may decide to place the controls in a more local or remote situation. For instance, in difficult environmental situations like heavy vibrations, controls will be better situated if mounted remotely from these environmental constraints. However, if communication links are long it may be more effective to locate as much decision making as possible on the actuator itself. **BERNARD ST** range lets you choose the most appropriate solution.

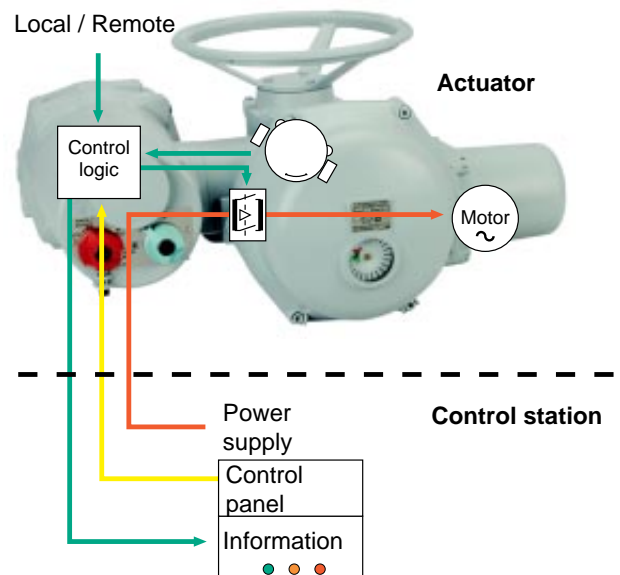
STANDARD version

- Your control system will receive all necessary informations from the actuators sensors.
- Your system will monitor and check actuator functions and then decide the appropriate actions corresponding to your specific process needs.
- This solution is particularly well suited with straight forward processes and extreme environmental conditions (nuclear application, extreme temperature, high vibration level,...).



INTEGRAL+ version

- Programmable **INTEGRAL+** controls ensure the full control of the actuator including status reports, fault treatment, protections and orders processing. In addition it offers local controls that can be disabled locally or remotely.
- Your system has only to send the orders; the **INTEGRAL+** unit will take care of every thing else.
- When your application calls for modulating action, just add the positioner option for full modulating capability.



CHOICE IS YOURS

ALL YOUR REQUIREMENTS

BUS version

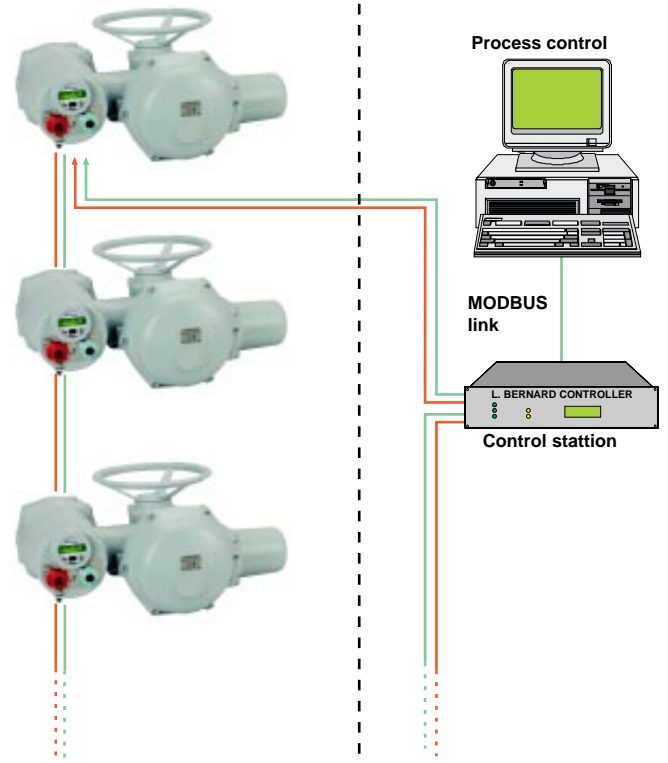
- Compatible with INTEGRAL+, our BUS systems allows you to communicate a great quantity of information with the same simple 2 wires link between many actuators as well as other products.
- There again, you have the choice to use our DS100/DS200 fully redundant BUS which constitutes a complete system or use one of our many interfaces with your own BUS :
 - PROFIBUS
 - MODBUS
 - others...

And for sophisticated applications :

INTELLI+

A truly **INTELLIGENT** actuator system including :

- **BIDIRECTIONAL** communication for status reporting, commissioning and controls without any need to open the actuator,
- Multilingual digital display that will guide you through all steps.
- PC based software for field commissioning and valve and actuator diagnostics.
- Fully programmable microprocessor based logic for :
 - valve and actuator data recording,
 - position and torque processing modes
 - fault treatment with different fault tolerance levels available.
- Totally immune to power interruption without any DC or battery back-up,
- Taking full advantage of the ST range reliable sensors,
- Fully BUS compatible



GENERAL

BERNARD ST Range actuators are designed for ON-OFF and CLASS III modulating operation of valves and dampers (see modulating class definition in our User's Guide).

Basic actuators include motor with thermal protection, gear case, emergency h/w, connection box, position and torque sensors, output drive. Integral actuators include in addition : logic board, interlockable starters, protection and local controls : selector switch + control switch. All models are available in weatherproof and ex-proof enclosures.

TEMPERATURE RANGE

Standard design : -20 °C to +70 °C
: -4 °F to +158 °F

Low temperature design : -40 °C to +70 °C
: -40 °F to +158 °F

High temperature design : +0 °C to +90 °C
(standard version only) : +32 °F to +194 °F

MOTORS

- 3-Phase squirrel cage induction type TENV equipped with embedded thermal protection available in all standard voltages 50 or 60 Hz.
- 1-Phase squirrel cage induction type TENV motor available on ST6, ST14 - 50 or 60Hz
- Motors are easily removable with front and rear ball bearings
- Motors rated to S4 service (intermittent duty with starting under load) according to IEC 34-1
- Duty rating : 30% for ON-OFF
50% for modulating duty Class III
- 360 Starts / hour - On-Off
- up to 1200 Starts / hour - Class III

GEARCASE

- Main reduction through worm & wheel : the choice of large center distance allows to minimize load factors on the gears.
- Shafts of the power drive are all mounted on roller bearings.
- The gear reduction is irreversible at all speeds.

LUBRICATION

Semi-fluid grease SHELL Tivela Compound A

<u>Grease weight</u> :	ST6	1,5 kg	3.3 lbs
	ST14	2,0 kg	4.4 lbs
	ST30	3,0 kg	6.6 lbs
	ST50	3,5 kg	7.7 lbs

EMERGENCY OPERATION

Through handwheel which does not move during electric operation. Change mode between manual and electric is automatic both ways without any declutch (except ST6).

Electric mode has always the priority.

<u>H/W reduction</u> :	ST6	1:1
	ST14-30	1:2
	ST50	1:17

SENSORS

- Information Source :
Position : helical reduction gear on main shaft
Range : 1,5 to 1080 turns

Torque : dynamometric balance measuring the actuator torque. Action is maintained after motor is stopped. Torque springs are calibrated at manufacturing plant.

- Information treatment and setting :
Standard and INTEGRAL+ version :
Both torque and position values are indicated by SPDT switches, that can be set independantly for each direction of rotation. Setting is possible at any point of the setting ranges and do not necessitate any specific tooling.

INTELLI+ version :
Both torque and position values are transmitted through ABSOLUTE ENCODERS. All settings are registered and memorized in the electronic unit in non-volatile memories.

TERMINAL COMPARTMENT

- Screw-type terminals size 4 mm² for controls and power supply.
- Internal earth plug (internal and external earth plug for explosionproof design)

FOR ST ACTUATORS

- Double sealing : In INTEGRAL+ version the terminal compartment can be isolated from the control chamber.

CONDUIT ENTRIES

- Weatherproof : 2 x PG21 + 1 x PG29
- Explosionproof : 2 3/4" NPT + 1 x 1" NPT
- max : 4 x 3/4" NPT.

VISUAL POSITION INDICATION

- *Standard and INTEGRAL+* :
A dial type window provides position indication at all times even without any means of power supply.
- *INTELLI+* :
Digital back-lit display, 2 lines x 16 characters.

ENCLOSURES

- Aluminium die casting
- IP68 : 72 hours under 5 meters
- NEMA 6 C.S.A. NRTL certified

EX-PROOF VERSIONS

- CENELEC EEx d II B & II C T4 up to T6
- NEMA 7 C.S.A. NRTL certification
Class I Group B, C, D; div 1 & 2
Class II Group E, F, G; div 1 & 2

EXTERNAL CORROSION PROTECTION

Paint system :

- Zinc rich primer
- Epoxy intermediate coat
- Epoxy finishing coat AFNOR 1625

All cover fasteners captive and stainless.

CONTROLS

- *Basic* : according to wiring diagram S80000
All control elements are directly connected to screw type terminals.
- *INTEGRAL+* : according to wiring diagram S20000
(for details refer to brochure INTEGRAL+)
- *INTELLI+* :
(for details refer to brochure INTELLI+)

OPTIONS

- Remote position indication :
 - potentiometer 1000 Ω
 - position transmitter TAM 4-20mA,
 - others on request
- Intermediate positions by extra SPDT switches
- Special external protection
- Accessories : lever, stem cover,...

OTHER BERNARD ACTUATORS LINES



SD Direct quarter-turn
Catalog n° A101/01



Modulating range
Catalog n° A103/01

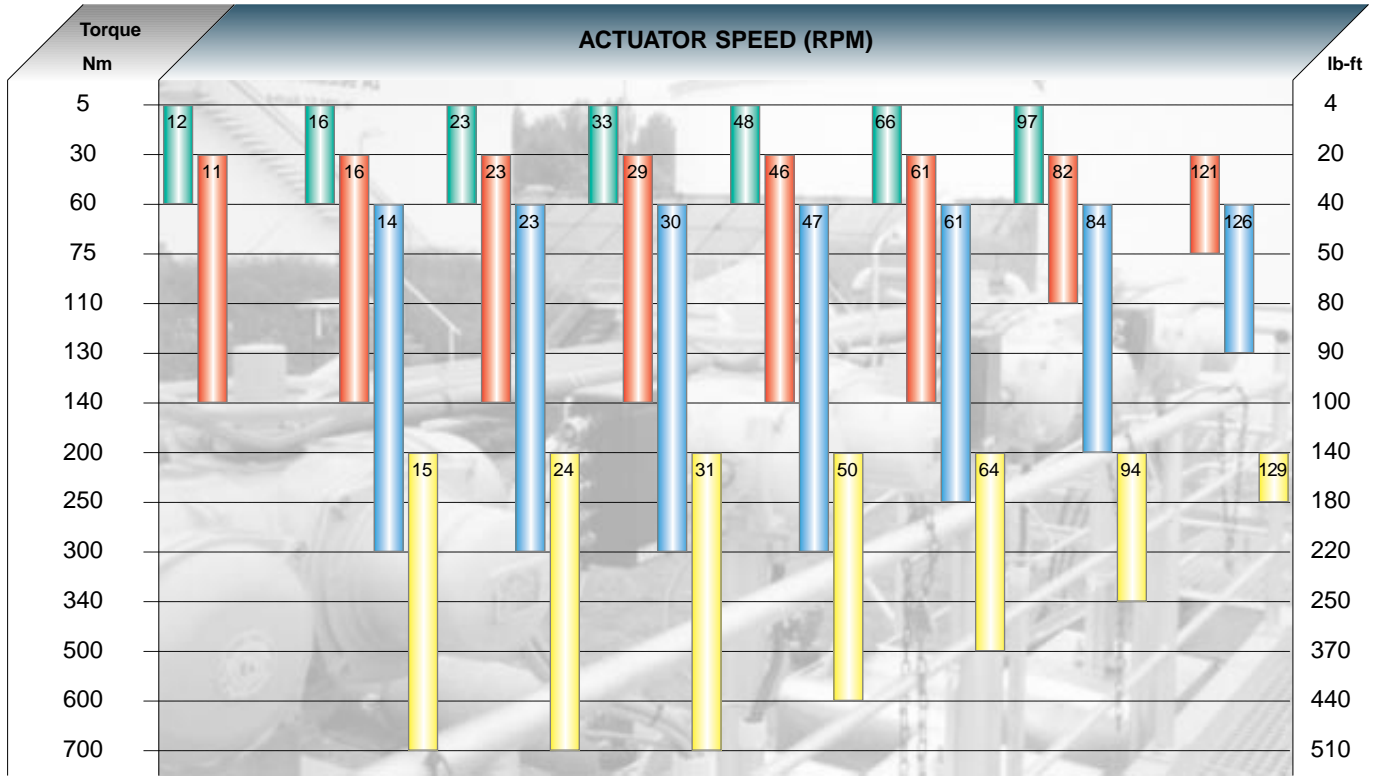
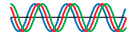


Fail- safe spring-return range
Catalog n° A105/00

Note : This brochure is subject to modification. Please inquire for latest issue.



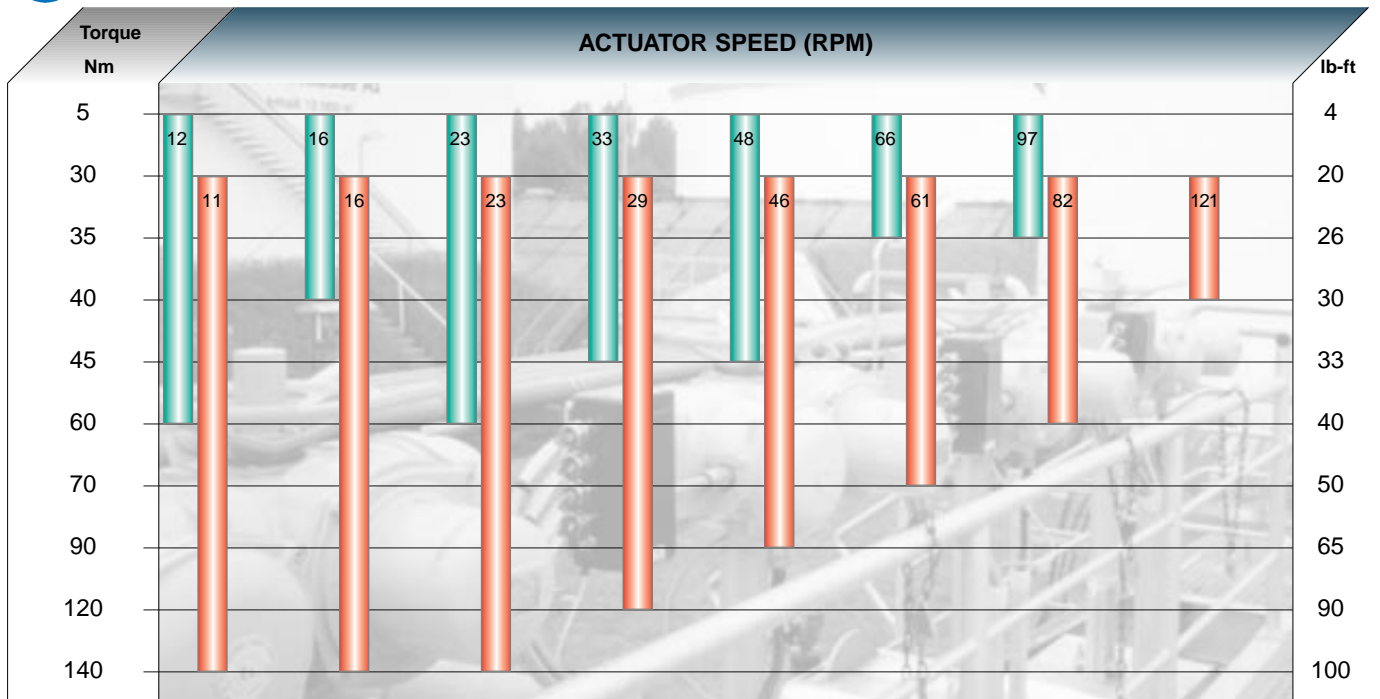
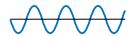
MULTITURN IN 3 PHASE 400 V 50 HZ



■ ST6
 ■ ST14
 ■ ST30
 ■ ST50

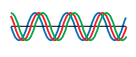


MULTITURN IN 1 PHASE 230 V 50 HZ

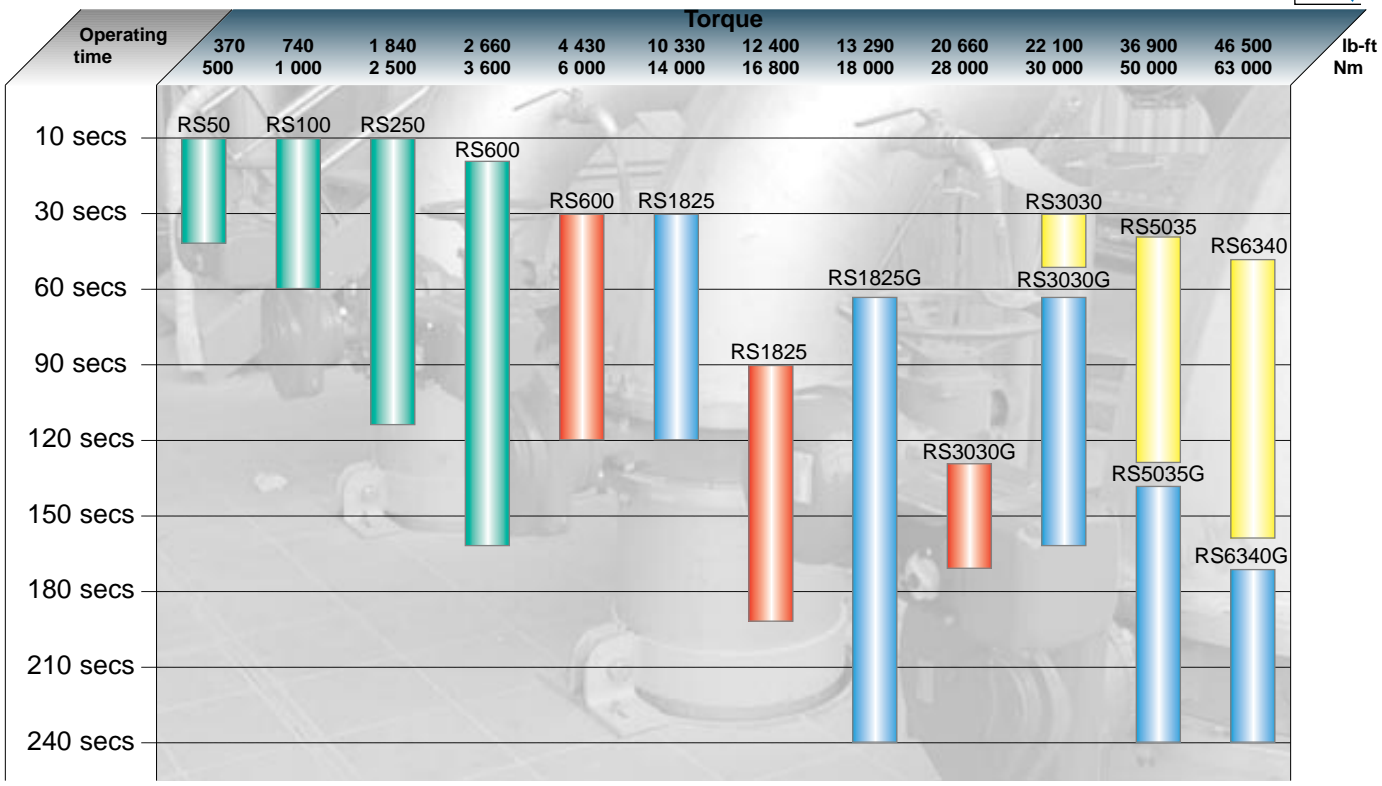


■ ST6
 ■ ST14

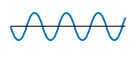
CHARTS



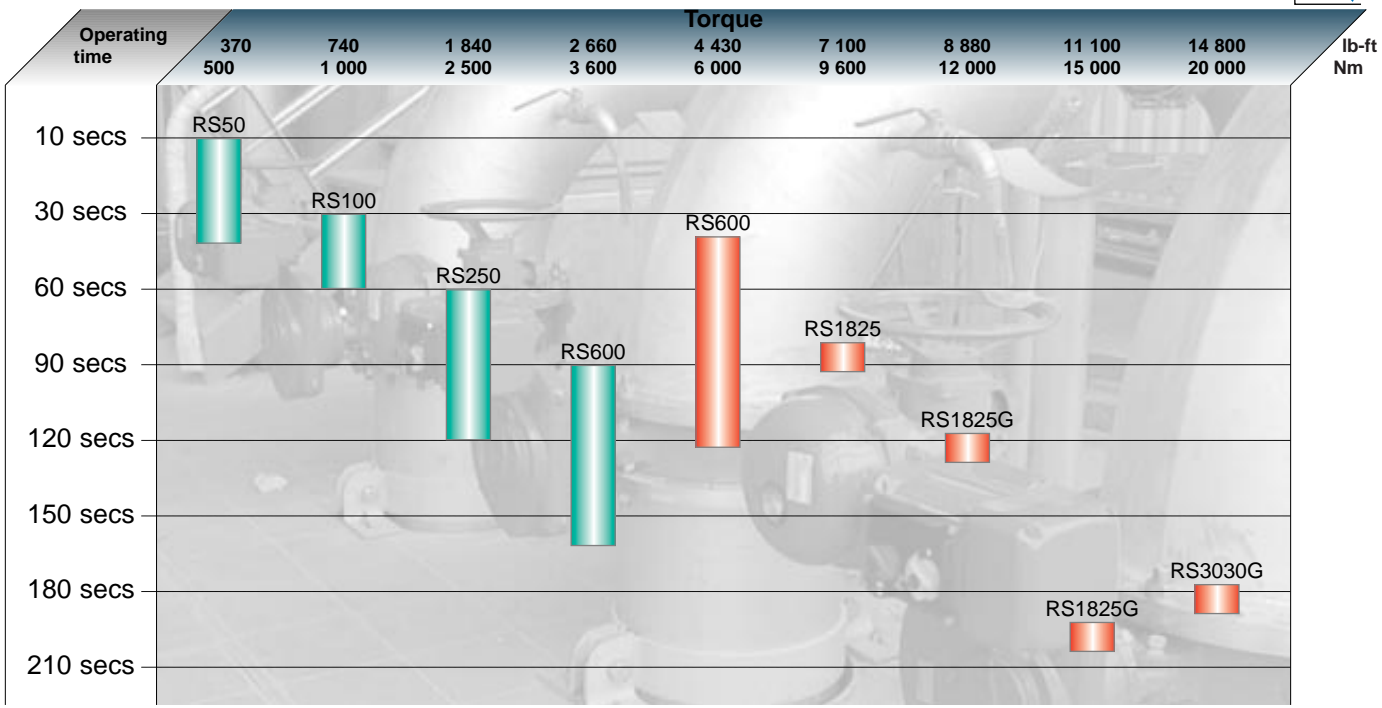
QUARTER-TURN WITH 3 PHASE MOTOR 400 V 50 HZ



■ ST6 + RS
 ■ ST14 + RS
 ■ ST30 + RS
 ■ ST50 + RS



QUARTER-TURN WITH 1 PHASE MOTOR 230 V 50 HZ



■ ST6 + RS
 ■ ST14 + RS

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