

*Valve Actuation
Made Easy*



Electric Actuators

ST-RANGE

B BERNARD CONTROLS INC.

U114_01

YOUR INDUSTRIAL APPLICATION DESERVES

THE RELIABILITY
OF
TRADITIONAL
ACTUATORS

combined
with

THE USER FRIENDLINESS
OF
21st CENTURY
TECHNOLOGY



THE NEW ST RANGE

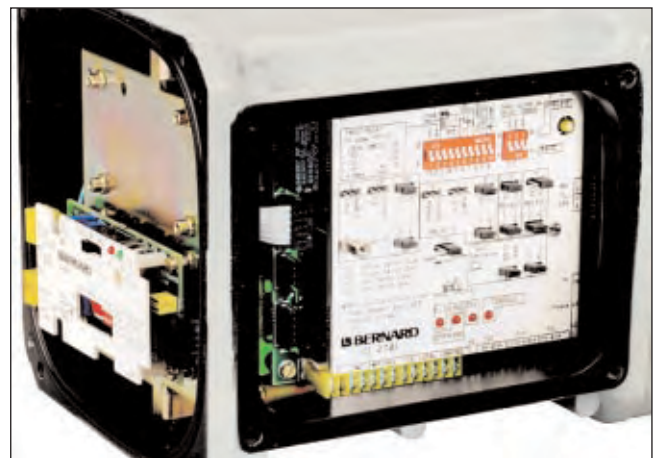
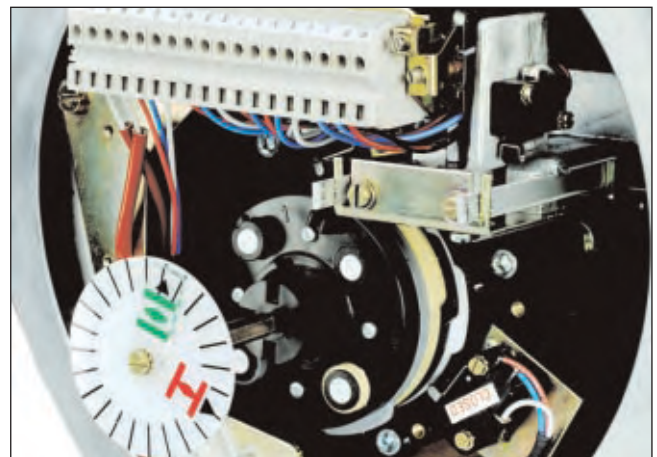
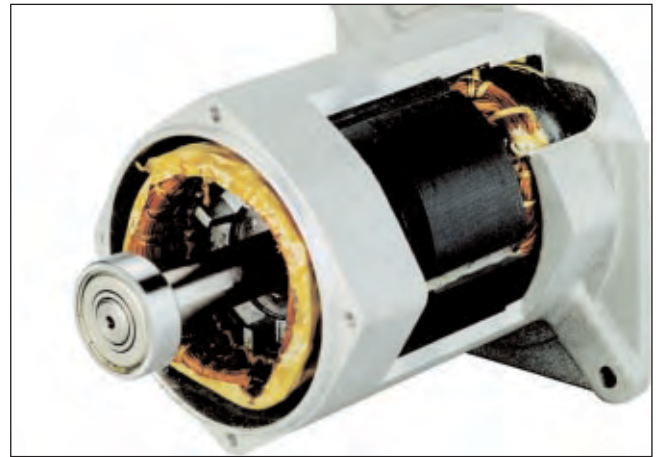
More than **50 YEARS** service in the **PROCESS INDUSTRY** has taught us how severe this environment can be and how important the commissioning phase is.

In designing the new ST Range, **BERNARD** has drawn on their half century of 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 FIELDBUS SYSTEMS**.



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 type of clutch device (except ST6), so full motor power drives the valve without any coupling interruption in the power drive.

For accurate information

3 4 POSITION & TORQUE SENSORS

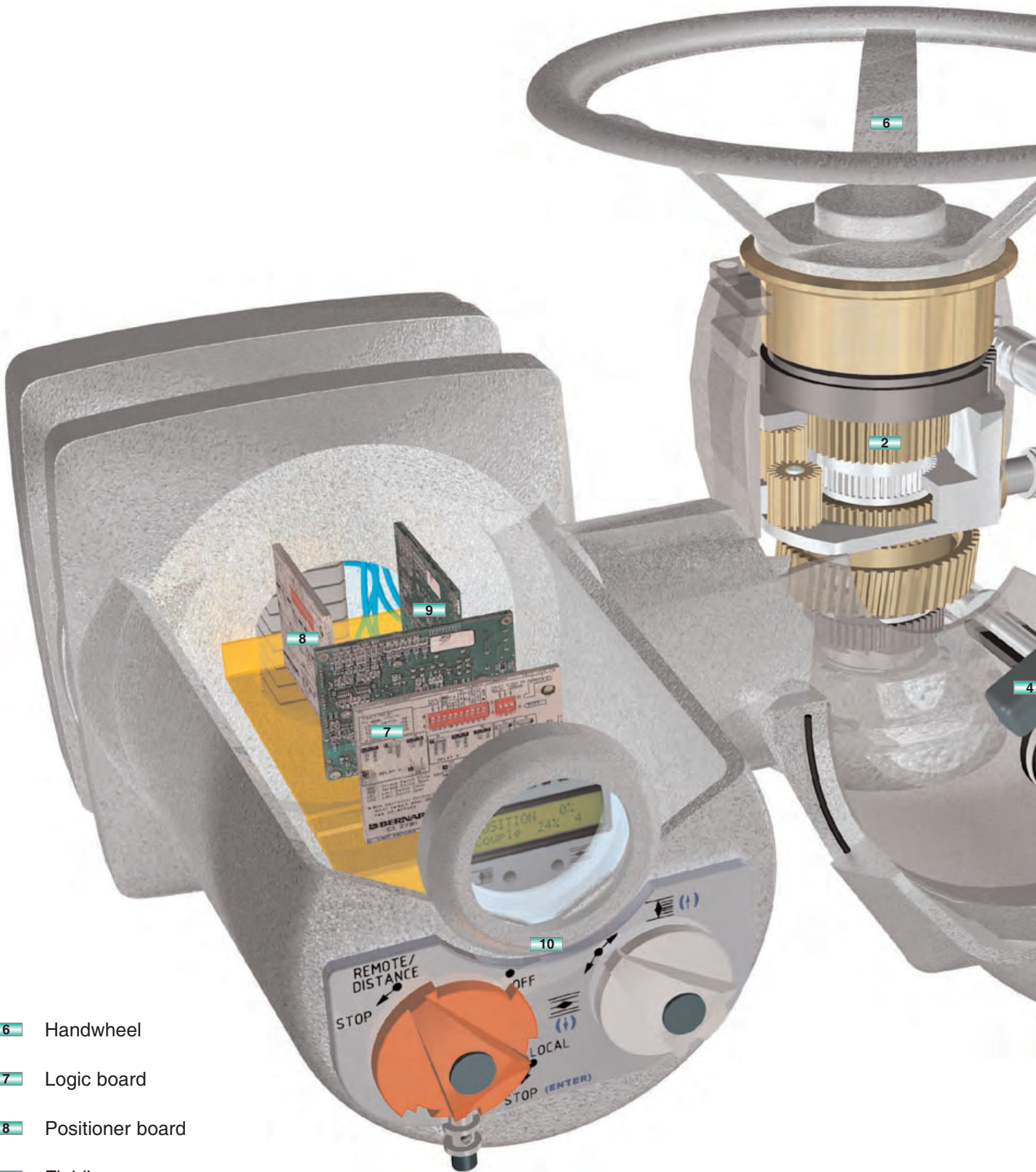
- Measure directly and proportionally:
 - valve travel
 - torque output
- The valve travel is measured through a mechanical link with the output shaft.
- The torque is measured by a dynamometric balance set at actuator output. In this way the control system is informed instantly of the actual torque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

For protection of your investment

5 ENCLOSURES

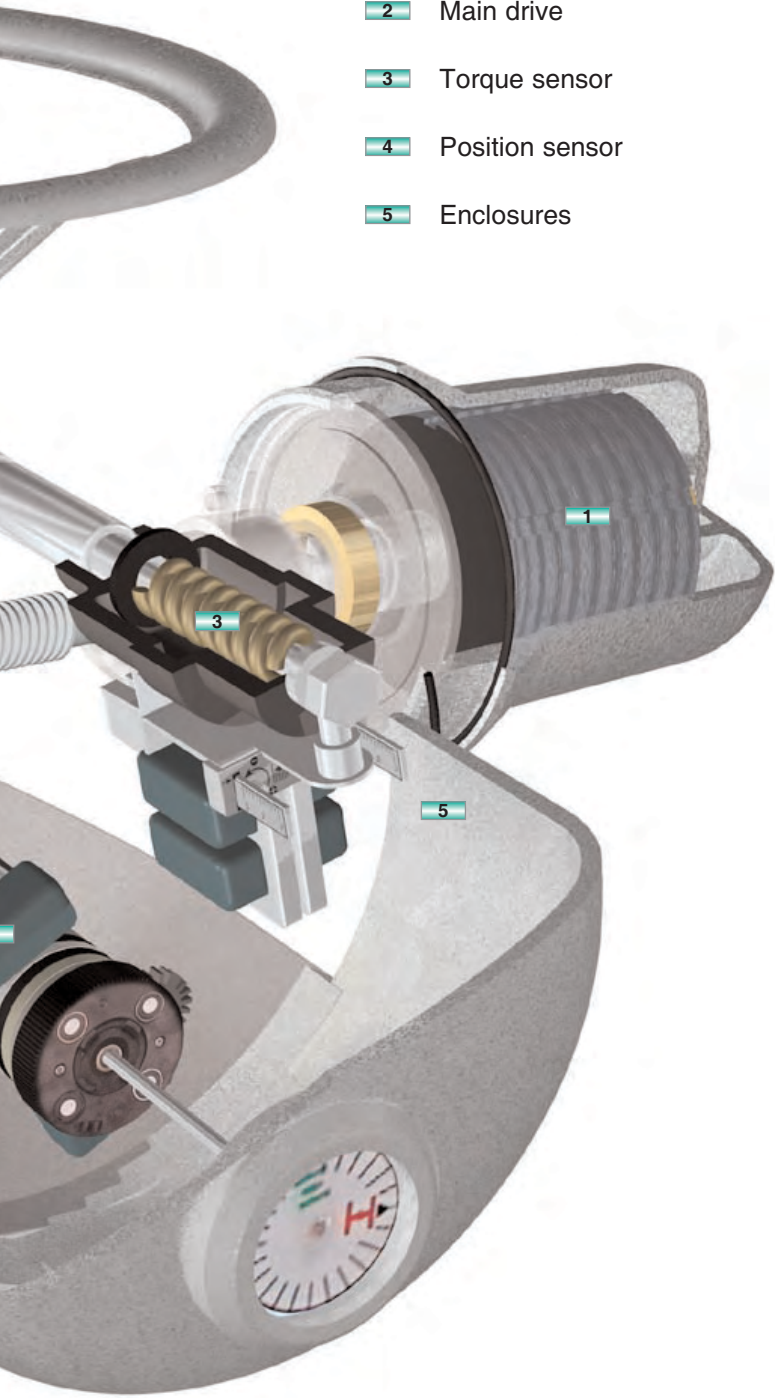
- Enclosures are watertight to IP68 & NEMA 6P which means they are able to withstand submergence to 5m (20 ft) for 72 hours.
- For explosive atmospheres, our actuators have received the qualification for the highest protection level:
 - CENELEC EEx d II CT 4 to 6
 - NEMA 7
- For the protection of the electronics, the control compartment of the actuator is completely isolated from the wiring compartment and local control is accomplished without intrusion into the control compartment.

OFFERS BOTH



- 6** Handwheel
- 7** Logic board
- 8** Positioner board
- 9** Fieldbus
- 10** Interactive communication

- 1 Motor
- 2 Main drive
- 3 Torque sensor
- 4 Position sensor
- 5 Enclosures



USER FRIENDLY SERVICE

For operator convenience

6 MANUAL OPERATION

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

For the comfort of all: Specifiers & Users

7 INTEGRAL+ LOGIC

- It allows for a selection from a wide variety of operating modes (including ESD). In addition, selection of modes is possible at any time even after initial installation.

5

For performance process control

8 GAM POSITIONER

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

For wiring simplicity

9 BUS SYSTEMS

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

and

For up to date communication, safety and full diagnostic capability

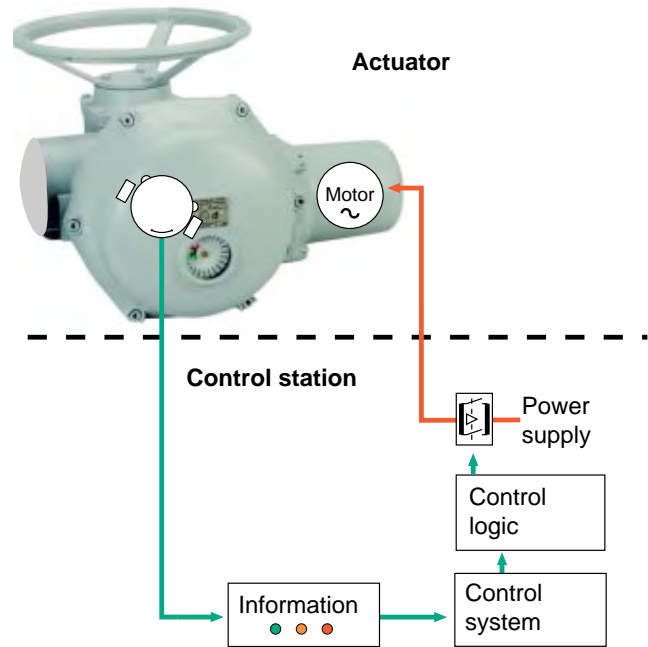
10 INTELLI+ VERSION

- Offers:
 - non intrusive settings
 - interactive communication
 - intelligent monitoring of your process
 - local and remote diagnostic 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 are better-off mounted remotely from these environmental constraints. However, if communication links are long, it may be more effective to locate as much of the decision making process on the actuator itself. The **BERNARD ST- Range** lets you choose the most appropriate solution.

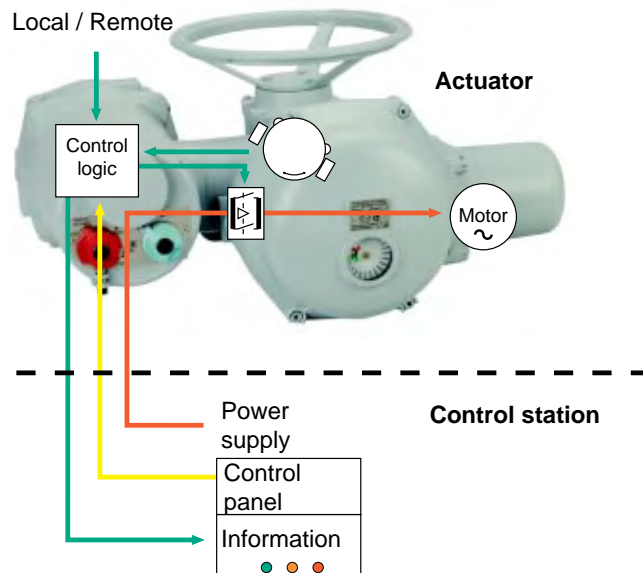
STANDARD version

- All necessary information for your control system will be received from the actuators sensors.
- Your system will monitor and check all actuator functions before deciding the appropriate actions corresponding to your specific process needs.
- This solution is particularly well suited with straight forward processes and extreme environmental conditions (nuclear applications, high vibration level, extreme temperature,...).



INTEGRAL+ version

- Programmable **INTEGRAL+** controls insure full control of the actuator, including status reports, fault treatment, protections and processing of orders. In addition it offers lockable local controls that can be disabled locally or remotely.
- Your system needs only to send the orders; the **INTEGRAL+** unit will take care of everything 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

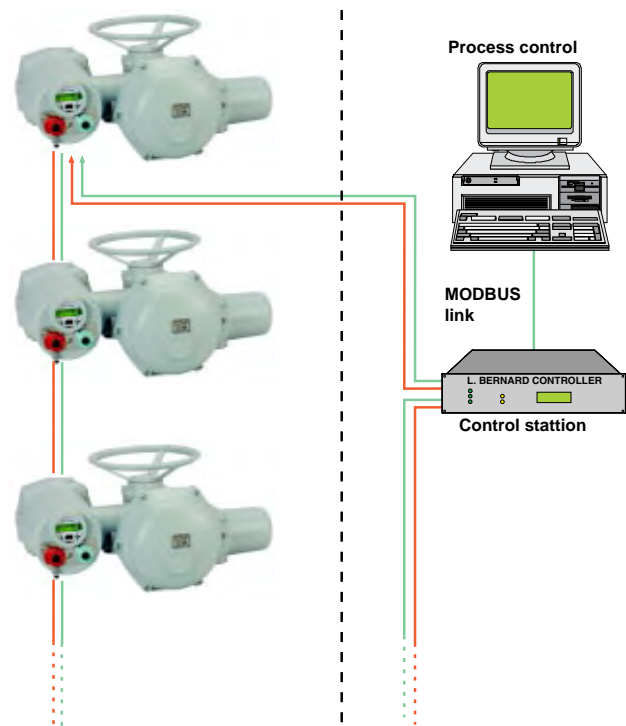
- Compatible with INTEGRAL+, our BUS system allows you to communicate a large number of information data over the same simple 2-wire link to many actuators as-well-as other devices.
- There again, you have the choice to use our DS100/DS200 fully redundant BUS which constitutes a complete system, or use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

And for sophisticated applications:

INTELLI+

A truly **INTELLIGENT** actuator system including:

- **BI-DIRECTIONAL** communication for status reporting, commissioning and controls without any need to open the actuator
- Multilingual digital display that will guide you through all steps forward and backward
- 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 U104_01).

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

TEMPERATURE RANGE

Standard design	: -20 °C to +70 °C : -28 °F to +158 °F
Low temperature design	: -40 °C to +70 °C : -40 °F to +158 °F
High temperature design (standard version only)	: +0 °C to +90 °C : +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 for models ST6 and 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 is through the worm & wheel - choosing a large center distance reduces the load factors on the gears.
- Power drive shafts are all supported on roller bearings.
- 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
	ST70	3.5 kg	7.7 lbs

EMERGENCY OPERATION

Through a unique handwheel system, that does not move during electric operation. The change in mode between manual and electric is automatic and without any declutch (except ST6).

Electric mode always has the priority.

<u>H/W reduction:</u>	ST6	1:1
	ST14-30	1:2
	ST70	1:17

SENSORS

- Information Source:
Position: helical reduction gearing on the main shaft
Range: 1.5 to 1080 turns

Torque: a dynamometric balance measures the actuator torque. Action is maintained even after the motor is stopped. Torque springs are calibrated at the factory.
- 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 through the setting ranges and does not require any specific tooling.

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

TERMINAL COMPARTMENT

- Screw-type terminals size 4mm² for controls and power supply
- Internal grounding lug (internal and external grounding lug for explosion-proof design)

FOR ST ACTUATORS

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

CONDUIT ENTRIES

- Weatherproof: 2 x 3/4" NPT + 1 x 1" NPT
- Explosionproof: 2 x 3/4" NPT + 1 x 1" NPT
- Maximum: 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 a power source
- INTELLI+:
Digital back-lit display, with 2 lines x 16 characters

ENCLOSURES

- Aluminium die casting
- IP68: 72 hours under 5 meters (20 feet)
- NEMA 6P C.S.A. US & Canada certified

EX-PROOF VERSIONS

- CENELEC EEx d II B & II C T4 up to T6
- NEMA 7 C.S.A. US & Canada 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 are 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° U101_01



Modulating range
Catalog n° U103_01

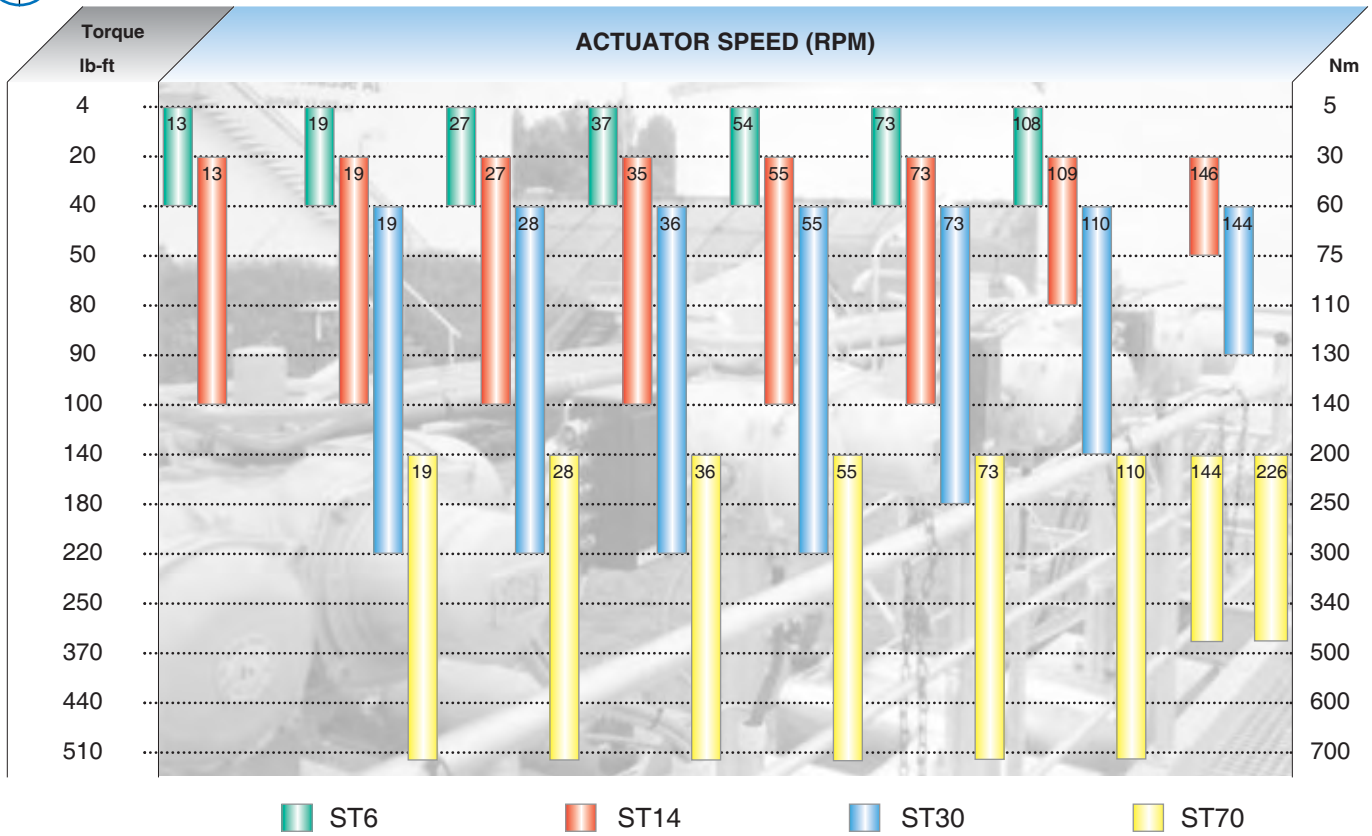
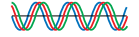


Fail- safe spring-return range
Catalog n° U105_01

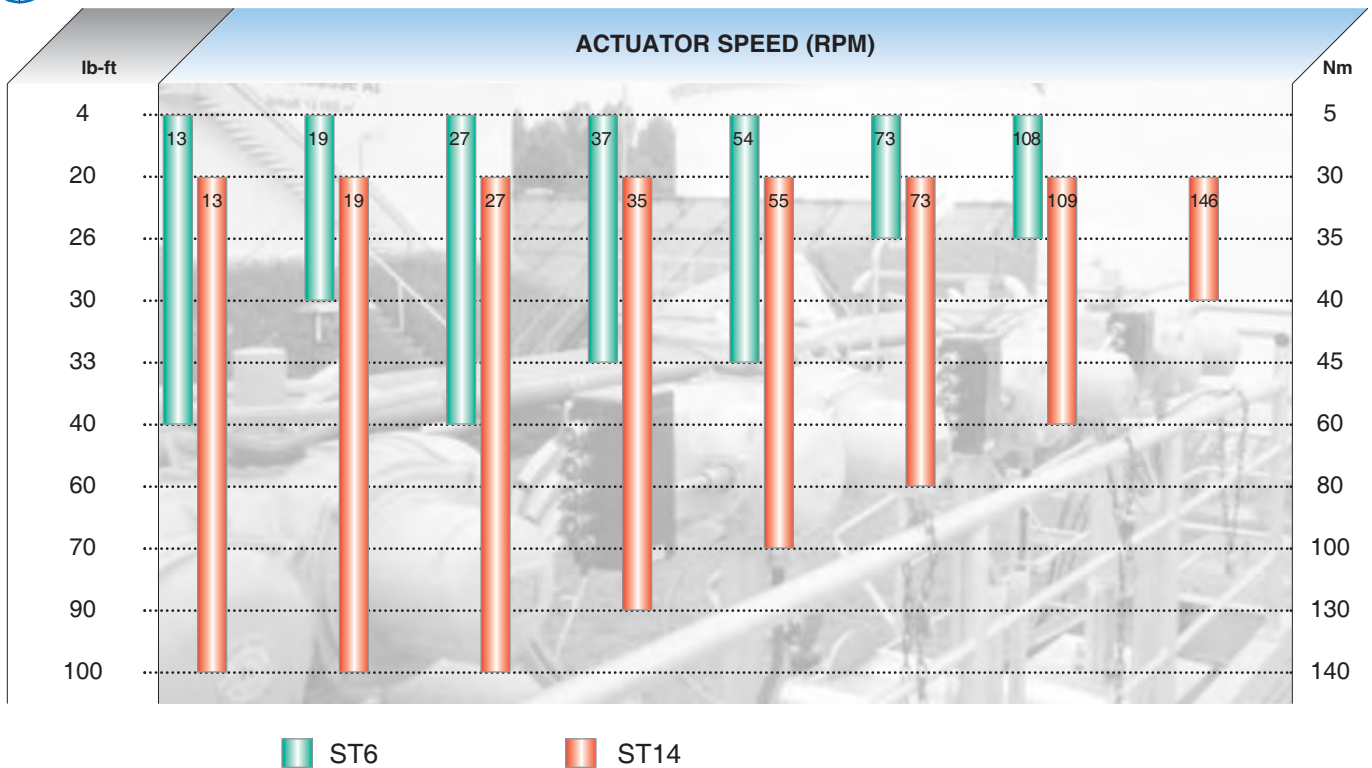
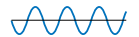
Note: This brochure is subject to modification. Please inquire for latest issue.



MULTITURN IN 3 PHASE 460 V 60 HZ



MULTITURN IN 1 PHASE 115 V 60 HZ



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