

LINEAR ACTUATORS

ACLE 101 - ACLE 002 - ACLE 103

INSTALLATION, OPERATION AND MAINTENANCE





Read this manual before installing, operating or maintaining this actuator. Failure to follow safety precautions and instructions could cause actuator failure and result in serious injury, death or property damage.

This manual provides important information on how to work with the actuator safely and efficiently. The manual is part of the device, must always be kept in the device's direct proximity and should be available for personnel to read at any time. Failure to comply with the installation, use and maintenance instructions indicated in this manual will result in immediate termination of the warranty conditions of the actuator and completely relieve SNT from any liability for damage caused to persons and / or property.

SNT does not assume direct or indirect responsibility for an improper use of the actuator, not respecting the performances of the actuator declared in the catalogs.

The manufacturer will not be liable for damage to the actuator or the equipment into which the actuator has been installed resulting from:

- disregarding this manual
- unintended use
- employment of untrained personnel
- unauthorized conversions
- technical modifications
- manipulation or removal of the screws on the device
- use of unapproved spare parts

The aforementioned conditions are therefore not contemplated and entail the immediate termination of the guarantee and the immediate decay of any responsibility on the part of SNT.

SNT reserves the right to make changes to the actuators and this manual without giving any notice.

LINEAR ACTUATORS ACLE 101-002-103

Installation, operation and maintenance manual

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1 MODELS COVERED BY THIS DOCUMENT

The present manual is referred to following products:

Acme screw linear actuators: ACLE101 - ACLE002 - ACLE103

2 IDENTIFICATION OF THE PRODUCT

2.1 Description of the product

For all the technical characteristics of the product (performance, features, dimensions) refer to the technical catalog.

Main actuator components:

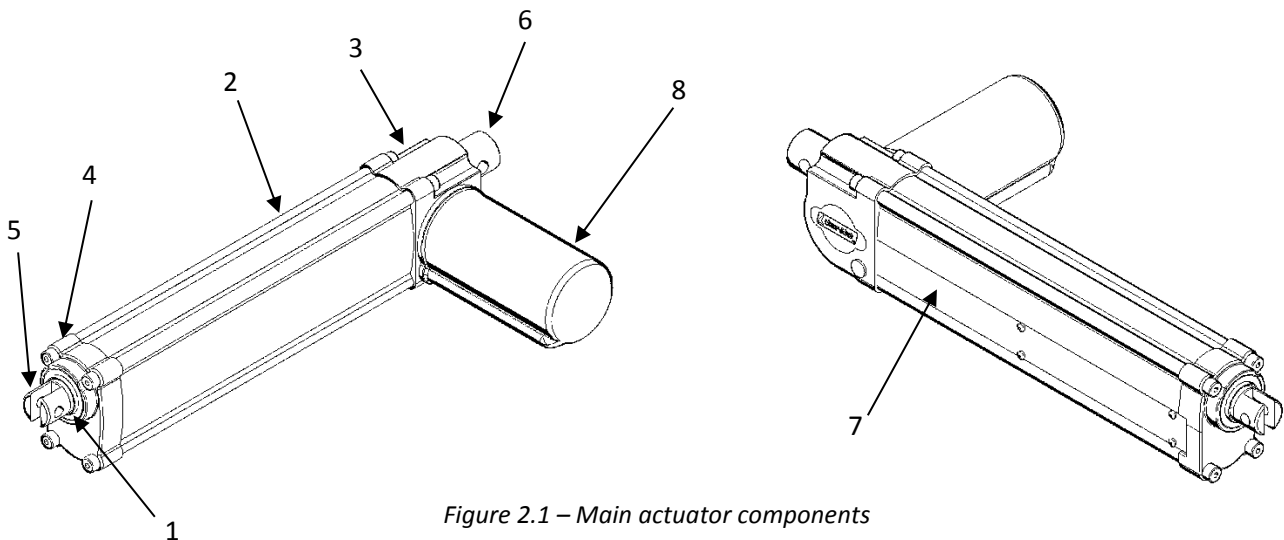


Figure 2.1 – Main actuator components

- 1) Push rod
- 2) External profile
- 3) Gearbox housing
- 4) Front housing
- 5) Rod end
- 6) Rear hinge
- 7) Stroke end limit switches cover
- 8) DC electric motor

2.2 Identification of the product

Every linear actuator is provided with a product label, which allows the product identification and gives technical information about the product.

On the actuator label following data are printed:

- CODE: article code;
- Product Description (the mining of symbols and their sequence are indicated on the catalogue);
- Production batch number (gives the full traceability of products);

3 TRANSPORT AND HANDLING

- ⚠ It is recommended to pay attention and care during the handling and transport of linear actuators not to damage mechanical parts and / or accessories and to prevent risks for the personnel in charge of this activity.
- The packaging must be lifted and moved with care and in a safe way.
- For lifting and transporting the linear actuator, the push rod must be in retracted position.
- Lift the actuator from the housing and outer tube, supporting the motor during transport.
- DO NOT lift the actuator only from the push rod and / or the motor.

In case of doubt, consult SNT to get the appropriate information and prevent any kind of damage!

4 USE RESTRICTION

The information contained in this chapter provides important prescriptions for operating safely during all phases of the product's life.

Not knowing or not complying with these provisions can generate dangerous situations that could cause damage to equipment and risks for the safety of persons.

4.1 Intended use

Actuators are used to perform very different functions within machines. It is the responsibility of the machine builder to design the application in compliance with the laws in force in the specific sector and in the field of safety, in compliance with the requirements provided in the product catalog and in this manual.

- ⚠ ACTUATORS ARE ELECTRIC AXIS, WHATEVER DRIVER OR CONTROL WILL BE USED: THE SELECTION OF THE PRODUCT AS STROKE, SPEED, TYPE OF LIMIT SWITCHES, MOTOR AND BRAKE, MUST BE DONE ACCORDING TO THE BEHAVIOR EXPECTED, IN FUNCTION OF THE TYPE OF CONTROL CHOSEN AND THE STATIC AND DYNAMIC BEHAVIOR OF THE SYSTEM IN WHICH THE ACTUATOR IS PLACED!

The actuators have been designed and built to operate mobile parts of various types, shapes and construction, in the ways and within the limits set out in the descriptions and tables of the technical data in the catalog and in this user manual.

The actuators are designed to work with a purely axial applied load.

They must be subjected to the loading and speed conditions specified in the catalog.

Modification of parts of the actuator or replacement of components with different and non-original parts is not permitted. The replacement of components with original spare parts is carried out only by SNT.

Any different use is to be considered improper and therefore potentially dangerous for the safety of the operators, as well as such as to void the contractual guarantee.

In the event of particular processing requirements, we recommend consulting our sales department. Every modification must be authorized by SNT with written documents.

- ⚠ ANY OTHER USE OUTSIDE THAT THAT JUST DESCRIBED IS NOT PERMITTED BY SNT.

4.1.1 Use restrictions

Actuators can not be used for unforeseen applications.

Any utilization of this device beyond its intended purpose may lead to potentially hazardous situations.

Therefore:

- Strictly adhere to all safety precautions and instructions in this operating manual.
- Do not allow this device to be subjected to weather conditions, strong UV rays, corrosive or explosive air media as well as other aggressive media (*).
- Do not modify, retool or change the structural design or individual components of the actuator.
- Never use the device outside of the technical application and operational limits.

(*) – THE USE OF THE ACTUATOR IN ABOVE CONDITIONS MUST BE PREVIOUSLY DECLARED AND AGREED WITH SNT, SINCE A SPECIAL EQUIPMENT OF THE PRODUCT MUST BE PROVIDED.

4.1.2 Standard operating conditions

The actuator must be used in an environment whose conditions comply with the provisions of SNT. The works necessary for obtaining and maintaining that conditions are in charge of the owner and, where applicable, are in charge of the end user.

The actuator must be installed and used indoor only, in dry area with environmental conditions as specified below:

- Temperature range +0°C ÷ +40°C
- Relative atmospheric humidity 5% ÷ 85%
- No build up of condensation

Linear actuator must be installed and used in a room with a constant illumination of 500lux at least, complying the norm UNI EN 1837:2009, or complying specific norms related to specific application fields.

⚠ THE USE OF THE ACTUATOR IN DIFFERENT CONDITIONS THAN JUST DESCRIBED MUST BE PREVIOUSLY DECLARED AND AGREED WITH SERVOMECH, SINCE A SPECIAL EQUIPMENT OF THE PRODUCT MUST BE PROVIDED.

4.1.3 Thermal limit

The actuator duty cycle permissible F_u [%] is the maximum working time expressed in percentage that the actuator can perform during the reference time period of 10 minutes, under rated load stated in the catalogue at ambient temperature 25°C, without risk of internal parts overheating.

$$F_u[\%] = \frac{\text{Max working time over 10 min}}{10 \text{ min}} \times 100$$

Actuator	F_u [%]
ACLE 101	15
ACLE 002	15
ACLE 103	15

⚠ For the proper operation do never exceed the permissible duty cycle limit.

4.2 Personnel requirements / Qualifications

This manual must be made available to the personnel in charge of installation, start up and use of the actuator. It is the responsibility of the machine builder:

- use personnel with the necessary qualifications for the installation and commissioning of the actuator;
- periodically check the qualification of the assigned personnel;
- check that the personnel in charge are aware of the contents of this manual.

5 STORAGE

- Do not store outside.
- Storage should be dry and dust-free.
- Keep away from any aggressive media.
- Protect from UV radiation.
- Avoid mechanical vibrations.
- Storage temperature: 0 to +50 °C.
- Relative atmospheric humidity: max. 95% (no build up of condensation).

6 INSTALLATION

The operations described in the paragraphs of this chapter provide both electrical and mechanical connections of the actuator, as well as the execution of test motions at reduced speed and motor torque or with small displacement steps.

6.1 Safety warnings

- ⚠ **MOTORS CANNOT BE CONNECTED DIRECTLY TO THE ELECTRICITY GRID. A PROPER CIRCUITS AND DEVICES FOR MOVEMENT MANAGEMENT ON BOTH DIRECTIONS IS REQUIRED. STROKE END LIMIT SWITCHES (MICROSWITCHES OR SENSORS) MUST BE CONTROLLED TO BE SURE THE LINEAR MOVEMENT OF THE ACTUATOR (DUE TO THE OPERATION OF THE MOTOR OR TO THE INERTIA OF THE MOVING PARTS) STOPS BEFORE TO REACH THE MECHANICAL STROKE END LIMITS. IN CASE THIS HAPPENS, THE ACTUATOR CAN BE LOCKED AND THE INTERNAL COMPONENTS CAN BE DAMAGED.**
- ⚠ **WHEN THE MOTORS MUST BE POWERED BY A CONVERTER (ELECTRIC DRIVE), THIS MUST BE CHOSEN BY QUALIFIED PERSONNEL.**
- ⚠ **IN CASE THERE ARE INVOLVED ELECTRONIC DRIVE AND CONTROL DEVICES ON THE ACTUATOR MOVING CONTROL, REFER TO MANUALS FOR ALL THE NECESSARY INFORMATION AND CORRECT INSTALLATION AND MAINTENANCE OF THE PRODUCT.**
- ⚠ **BEFORE TO PROCEED TO THE ELECTRIC CONNECTION, MAKE SURE THE SUPPLY VOLTAGE IS TURNED OFF.**
- ⚠ **BEFORE TO TURN-ON THE MOTOR, MAKE SURE THE ELECTRIC CONNECTIONS ARE TIGHTENED AND STABLE.**
- ⚠ **CHECK POWER SUPPLY CABLES NOT TO BE DAMAGED DURING THE COMMISSIONING. POWER SUPPLY CABLES MUST BE OUT OF HEAT SOURCES AND MOVING ORGANS.**
- ⚠ **DURING FUNCTIONING ARE PRODUCED MAGNETIC, ELECTRIC AND ELECTROMAGNETIC FIELDS. THIS MAY BE DANGEROUS FOR PEOPLE THAT USE CARDIAC STIMULATOR (PACEMAKER), IF NOT SUFFICIENT DISTANCE.**
- ⚠ **DO NOT DISCONNECT ANY CONNECTION DURING OPERATION OR IN PRESENCE OF SUPPLY VOLTAGE.**
- ⚠ **BEFORE TO TURN-ON THE MOTOR, MAKE SURE THE MECHANICAL CONNECTIONS OF THE ACTUATOR REMAIN TIGHTENED AND STABLE, ALSO DURING THE OPERATION.**

- ⚠ DURING THE COMMISSIONING, UNEXPECTED MOVEMENT OF THE MOTOR MAY BE CAUSED BY:
 - WIRING ERRORS
 - MOUNTING ERRORS
 - DAMAGES ON POWER SUPPLY CABLES
 - HARDWARE OR SOFTWARE ERRORS
 - DRIVER PARAMETERS ERRORS
 - OPERATION IN CONDITIONS OUTSIDE THE SPECIFICATIONS PROVIDED BY THE CATALOG AND THIS MANUAL
- ⚠ MAKE SURE THE SAFETY PROTECTION OF THE MACHINE (MECHANICAL AND ELECTRICAL) ARE ACTIVE.
- ⚠ DURING OPERATION, TEMPERATURE OF THE EXTERNAL SURFACE OF MOTORS CAN REACH HIGH TEMPERATURES. HOT SURFACES ON ACTUATOR CAN CAUSE BURNS AND SHOULD NOT BE TOUCHED.
- ⚠ DO NOT FASTEN OR PLACE NEAR THE MOTOR THERMO SENSITIVE COMPONENTS: DAMAGES MAY OCCUR.

6.2 Stroke end limit switches FC2

Each of the two micro-switches is fitted in a slot with a cam for switches commutation. A screw allows to lock the assembly in the desired position, adjusting in this way the switching position. The nut with suitable shape makes the cams rotate, so to activate the switches. This cam-operated device provides a stable and self-keeping commutation of the switches.

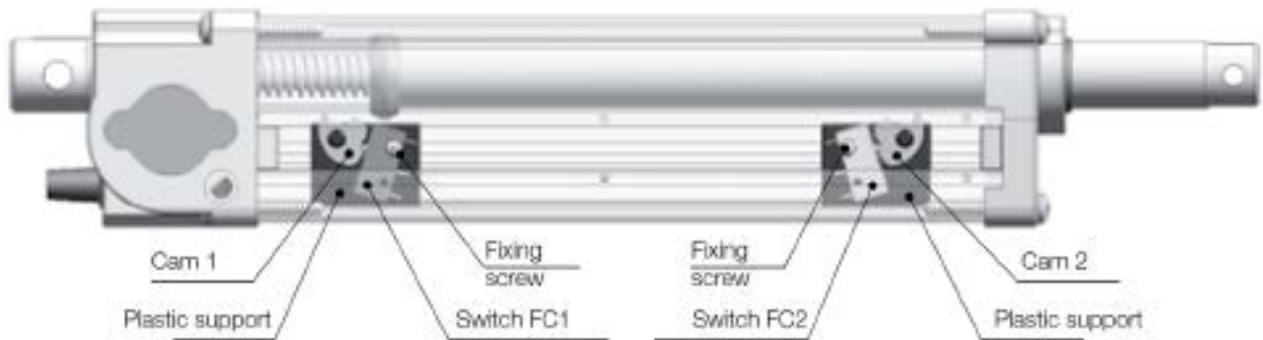


Figure 6.1 – Stroke end limit switches FC2

- RETRACTED ACTUATOR (Lc) position is adjusted and controlled by **FC 1** switch.
- EXTENDED ACTUATOR (La) position is adjusted and controlled by **FC 2** switch.

Following pictures show the switching sequence of the switch.

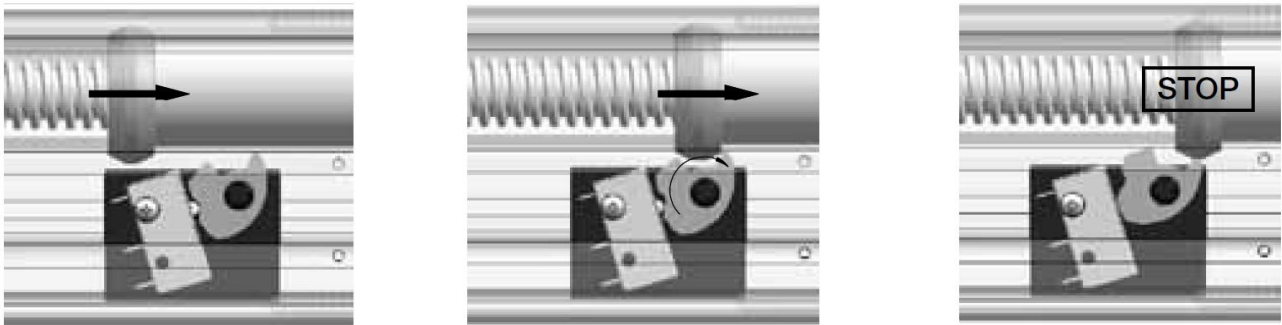


Figure 6.2 – FC2 functioning

To setup the stop positions:

- Loosen the screws (1) of the limit switches cover.
- Remove the cover (2): pull out side A first (push rod side), then side B (gearbox side).
- Loosen the switch fixing screw (see Fig. 6.1).
- Move the plastic support on the required position.
- Screw fasten the fixing screw again and close the cover.

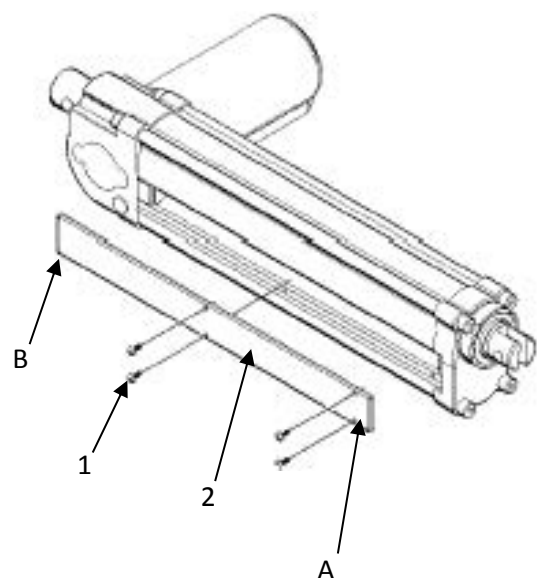


Figure 6.3 – FC2 limit switches setup

Limit switches FC2 – TECHNICAL FEATURES		
Contact	Standard: NC On request: NO, CS	
Supply voltage	250 V AC	30 V DC
Max current (resistive load)	12 A	5 A
Max current (inductive load)	6 A	3 A
Output	Multicore PVC cable - length 0.3 m	

- ⚠ For FC2 limit switches wiring instructions: see Section 10.
- ⚠ DO NOT TRAVEL OVER THE STROKE LIMIT SWITCHES POSITIONS, AVOIDING TO REACH MECHANICAL STOP AND PREVENTING DAMAGE TO THE INTERNAL COMPONENTS OF THE ACTUATOR.

6.3 Stroke end limit switches FC2X

Technical features, setup instructions and functioning of FC2X limit switches is the same as FC2 switches (see Section 6.2).

The two electric cam-operated switches are internally wired between power supply and electric motor, in order to switch off the power supply directly, without relays.

- ⚠ With FC2X limit switches wiring it is NOT possible to read signal coming from the switches. For this reason it is recommended to provide a timing control on motor power supply and/or a current limit on the power supply circuit.

Wiring of limit switches and electric motor is shown on following schemes:

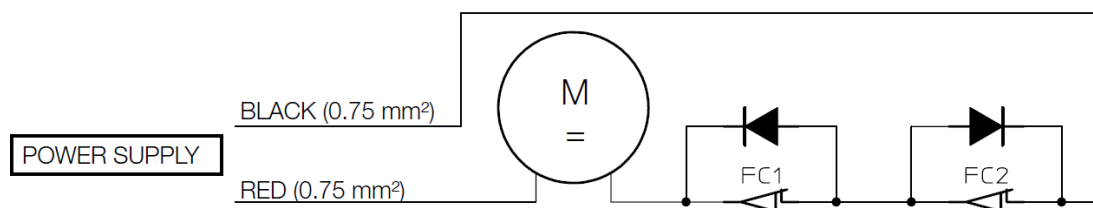


Figure 6.4 – Stroke end limit switches FC2X

- ⚠ For wiring instructions: see Section 10.

6.4 Encoder GI21 - GI24

Encoder GI21-GI24 – TECHNICAL FEATURES	
Transducer type	Hall effect probe, incremental, bidirectional
Resolution	1 pulse/rev (GI21) - 4 pulses/rev (GI24)
Output	PUSH-PULL 2 channels (A/B)
Supply voltage	5 ÷ 24 V DC
Max commutable current	50 mA
Cable length	0.3 m
Electrical protection	Polarity inversion Supply voltage peaks

Wiring scheme:

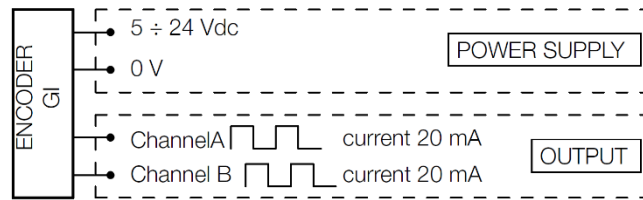


Figure 6.5 – Encoder GI21/GI24

Following table shows n° of pulses for 100 mm of stroke, for each actuator size and ratio:

N° of pulses for 100 mm of stroke		Encoder resolution	
		1 ppr (GI21)	4 ppr (GI24)
ACLE101	RL1	967	3867
	RL2	483	1933
	RN1	383	1533
	RN2	192	767
ACLE002	RL1	1550	6200
	RL2	775	3100
	RN1	492	1968
	RN2	246	984
ACLE103	RL1	1725	6900
	RL2	862	3450
	RN1	650	2600
	RN2	325	1300

⚠ For GI21 - GI24 encoder wiring instructions: see Section 10.

6.5 Electric DC motor wiring

Connect the motor to the power unit of the plant or to the driver according to the following wiring diagrams:

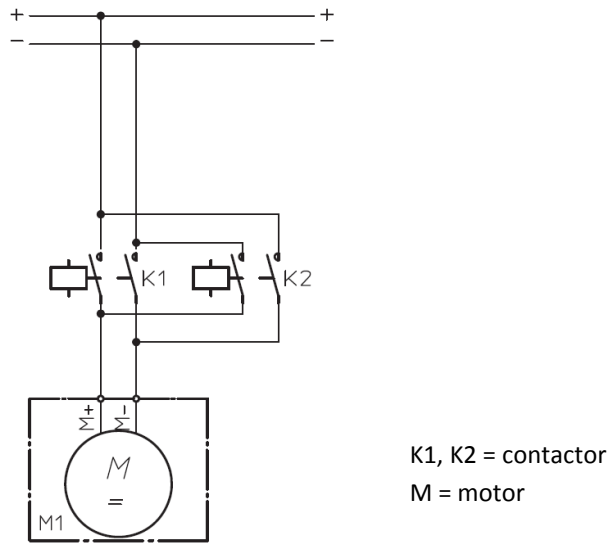


Figure 6.6 – Electric wiring diagrams to power supply of DC motor

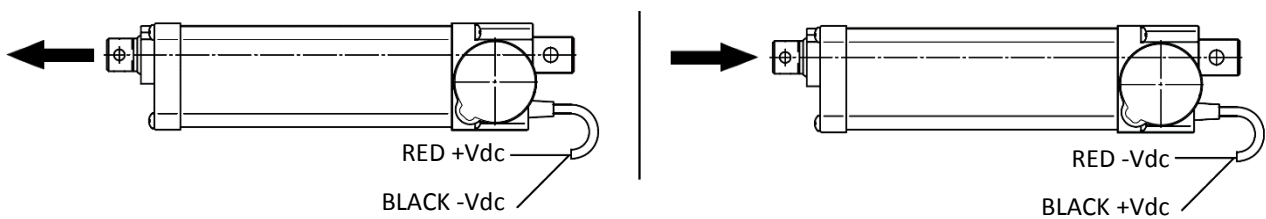


Figure 6.7 – DC motor wiring

Check if the push rod shifting direction is compatible to the indications on the control unit, by powering the electric motor on VERY BRIEFLY.

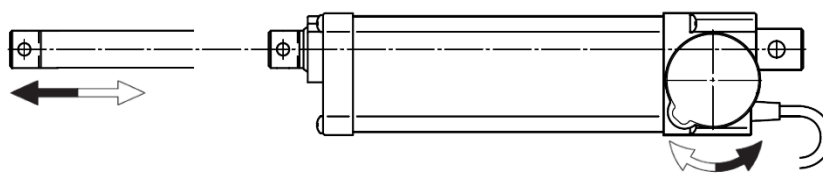


Figure 6.8 – Push rod shifting directions

- ⚠ If the push rod shifting directions are not compatible: invert contacts of the two motor supply cables.
- ⚠ For stroke limit switches and/or encoder wiring instruction: see Section 10.

6.6 Linear actuator installation

⚠ ALL MECHANICAL AND ELECTRICAL PROTECTION MUST BE INSTALLED AND ACTIVATED TO PREVENT DAMAGE TO PERSONS OR PROPERTY.

- Check that all plant fixing elements are well machined and cleaned, and that they fit the dimensions of the actuators fixing elements they have to be fixed to.
- If the length of the actuator have to be changed (push rod more retracted or extended) during installation, power the motor with limited speed and torque values, in order to avoid possible damages in case of a mechanical stop is reached.
- In case of actuators without anti-rotation device (AR), it is possible to manually screw/unscrew the push rod to change the length of the actuator.

⚠ DO NOT SET THE LENGTH OF THE ACTUATOR OVER ITS EXTREME VALUES:

- "Lc" = RETRACTED ACTUATOR
- "La" = EXTENDED ACTUATOR

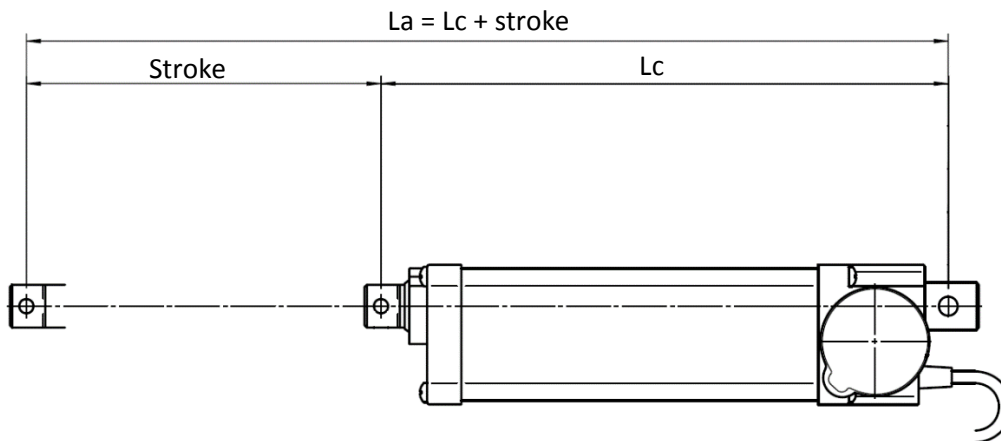


Figure 6.9 – "Lc" and "La" dimensions

Dimensions "Lc" and "La" are indicated in the technical catalogue of the product.

- Fit the actuator to the plant in order to have ONLY axial load applied to the actuator.
- Check the correct alignment between front and rear pins: they must be PARALLEL.
- Check the correct alignment between the actuator and the moving parts.

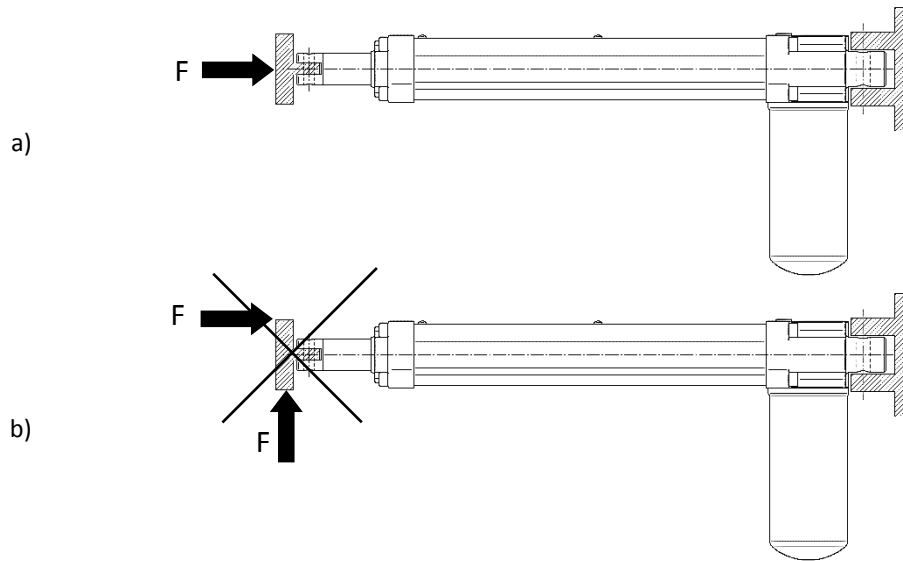


Figure 6.10 – Load on actuator: a) correct; b) not correct

⚠ RIGHT WORKING OF THE ACTUATOR AND PLANT CANNOT BE GUARANTEED IF SIDE OR NOT AXIAL LOAD ARE APPLIED TO THE ACTUATOR.

6.7 Installation of rod end fitting elements

- To install a mounting element on the rod end threaded bore (BA), use a wrench flat on the rod end to counterhold the locking torque.
- ⚠ In case of actuator equipped with AR (anti-rotation) device: DO NOT TRANSFER ANY TORQUE TO THE PISTON ROD.
- ⚠ WARNING: in case of torque transfer into the actuator with AR device, the internal mechanical components can be damaged.
- Fix the threaded element with Loctite 270.
- To unmount the element, heat the threaded area to unlock it.
- Unscrew the fitting element counterholding the torque with a wrench flat on the rod end.

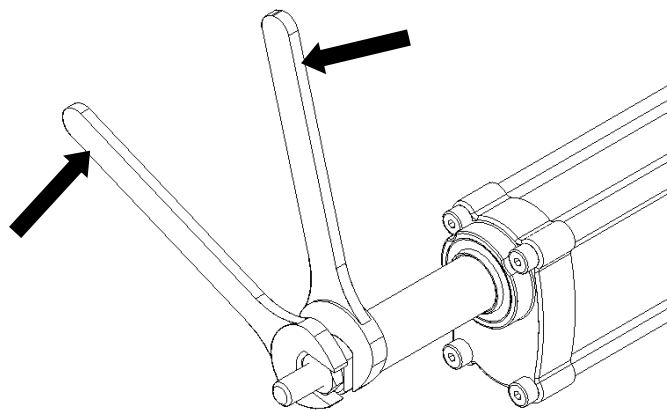


Figure 6.11 – Installation of rod end fitting element

7 COMMISSIONING AND USE

Linear actuators are supplied lubricated and ready to be used. Before to start commissioning and activation, the following checks must be carried out:

Shifting direction check

- Check if the push rod shifting direction is compatible to the indications on the control unit, by powering the electric motor on VERY BRIEFLY. If not, see Section 6.5.

⚠ For actuators without anti-rotation device (AR): TO ALLOW THE TRANSLATION OF THE ROD END, THE PUSH ROD ROTATION MUST BE REACTED BY USING EXTERNAL GUIDES.

Check of extreme working positions

- Check if the extreme dimensions of the actuator “Lc” and “La” (see Fig. 6.9) are compatible with extreme positions of the plant component that has to be moved.
- Measure the initial length of the actuator, then run the actuator GRADUALLY from the control unit, in order to reach the plant to its more distant extreme position.
- Check continuously the current actuator length during the motion.
- Repeat the same procedure for the other extreme position.

⚠ TO AVOID DAMAGES, DO NOT TRAVEL OVER THE EXTREME STROKE VALUES Lc and La!

⚠ DO NOT REACH STROKE END MECHANICAL STOP!

Commissioning

At this stage it is possible to start commissioning:

- Carry out one complete working cycle, without load, adjusting the previously set limit switch positions if necessary (see Sections 6.2).
- Carry out some complete working cycles, increasing gradually the load, until full load is reached.

⚠ DURING COMMISSIONING, DO NEVER EXCEED THE MAX ALLOWED DUTY CYCLE FOR THE LINEAR ACTUATOR INDICATED IN SECTION 4.1.4. ANY ABUSE OF SUCH DUTY CYCLE CAN CAUSE OVERHEATING AND UNINTENTIONAL PREMATURE DAMAGING!

8 LUBRICATION

Linear actuators ACLE101-002-103 series are supplied lubricated, with lubricants indicated in the table

ACTUATOR	GEARBOX	LINEAR DRIVE
ACLE101	Grease (NLGI 2 DIN 51818): ENI Grease SM 2 Also suitable: SHELL Gadus S2 V220D 2 (NLGI 2) MOBIL Mobilgrease XHP 222 Special (NLGI 2) FUCHS Renolit FLM 2 (NLGI 2)	Grease (NLGI 2 DIN 51818): ENI Grease SM 2 Also suitable: SHELL Gadus S2 V220D 2 (NLGI 2) MOBIL Mobilgrease XHP 222 Special (NLGI 2) FUCHS Renolit FLM 2 (NLGI 2)
ACLE002		
ACLE103		

Table 8.1 – Lubricants

- ⚠ DO NOT USE LUBRICANTS DIFFERENT FROM THOSE ABOVE MENTIONED.
- ⚠ DO NOT MIX INCOMPATIBLE GREASES.
- ⚠ IF DIFFERENT LUBRICANT SHOULD BE USED, PLEASE CONTACT SERVOMECH BEFORE PROCEED.
- ⚠ IN CASE OF CUSTOM PRODUCT EXECUTION, THE LUBRICANTS COULD BE DIFFERENT FROM THE STANDARD ABOVE.

9 MAINTENANCE

Linear actuators ACLE101-002-103 series are long-life lubricated and do not require any further relubrication. Maintenance tasks to be carried out monthly are described below:

- Visual inspections of actuator conditions.
- Cleaning of dirty parts of the actuator.
- Check of electric power supply and signal cables.

In case of lubricant leakage or malfunctions, contact SNT.

10 WIRING SCHEMES

For actuator electrical wiring instructions, please refer to following wiring schemes.

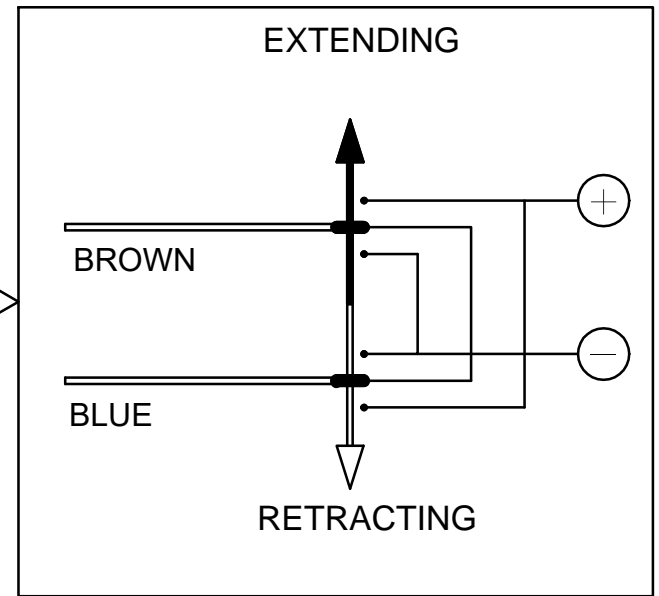
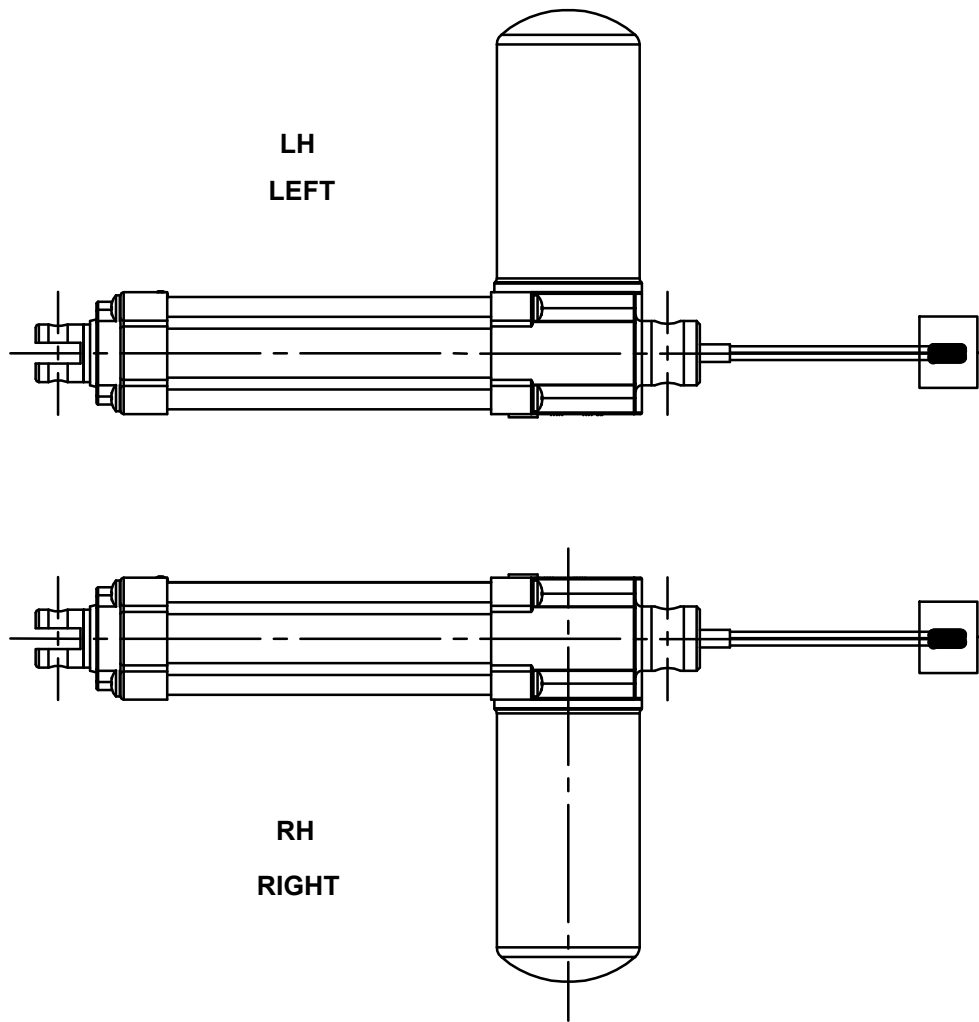
⚠ In case of special wirings, please refer to the wiring instructions supplied with the product.

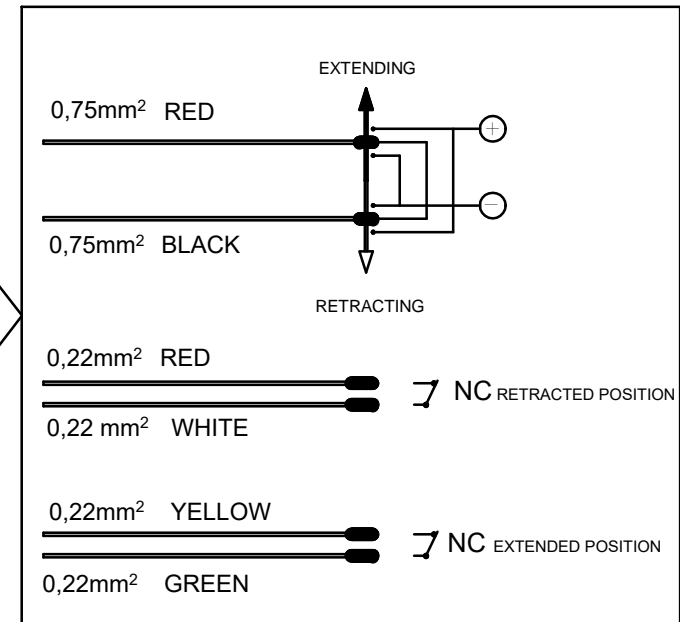
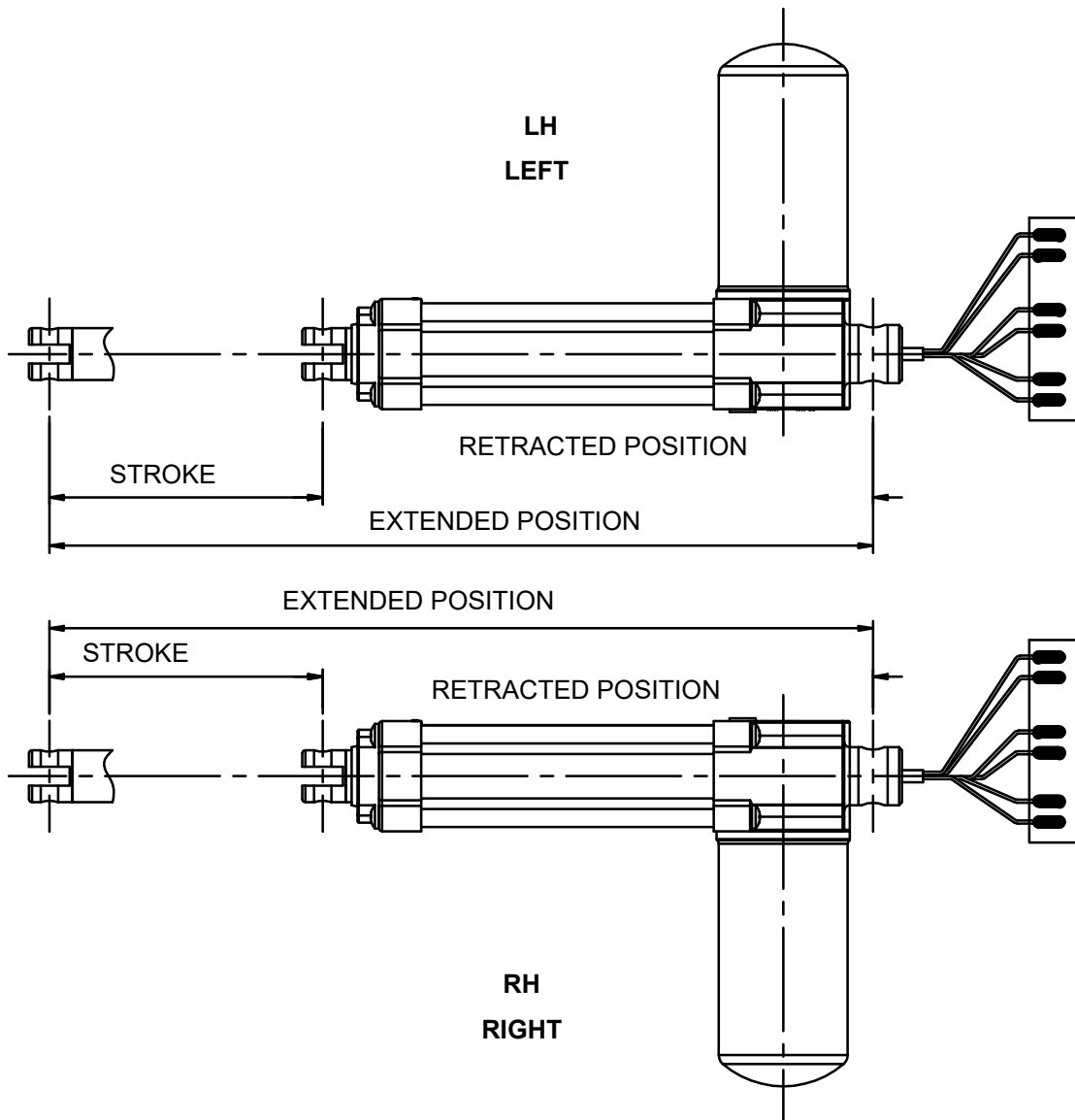
ACLE101 - 002	
ACTUATOR EQUIPMENT	SCHEME CODE
Motor DC	CA.31.01.70U
Motor DC + microswitches FC2 (NC)	CA.31.01.02U
Motor DC + microswitches FC2 (NO)	CA.31.01.18U
Motor DC + microswitches FC2 (CS)	CA.31.01.05U
Motor DC + microswitches FC2(NC) + GI2x	CA.31.01.33nU
Motor DC + microswitches FC2(NO) + GI2x	CA.31.01.74U
Motor DC + microswitches FC3 (NC)	CA.31.01.03U
Motor DC + microswitches FC2X	CA.31.01.01U
Motor DC + microswitches FC2X + NO	CA.31.01.63U
Motor DC + microswitches FC2X+FC3 (NC)	CA.31.01.04U
Motor DC + microswitches FC2X+FC3 (NO)	CA.31.01.20U
Motor DC + microswitches FC2X + GI2x	CA.31.01.34U
Motor DC + pulses generator GI2x	CA.31.01.30U

Table 10.1 – Wiring schemes of ACLE101 - ACLE002

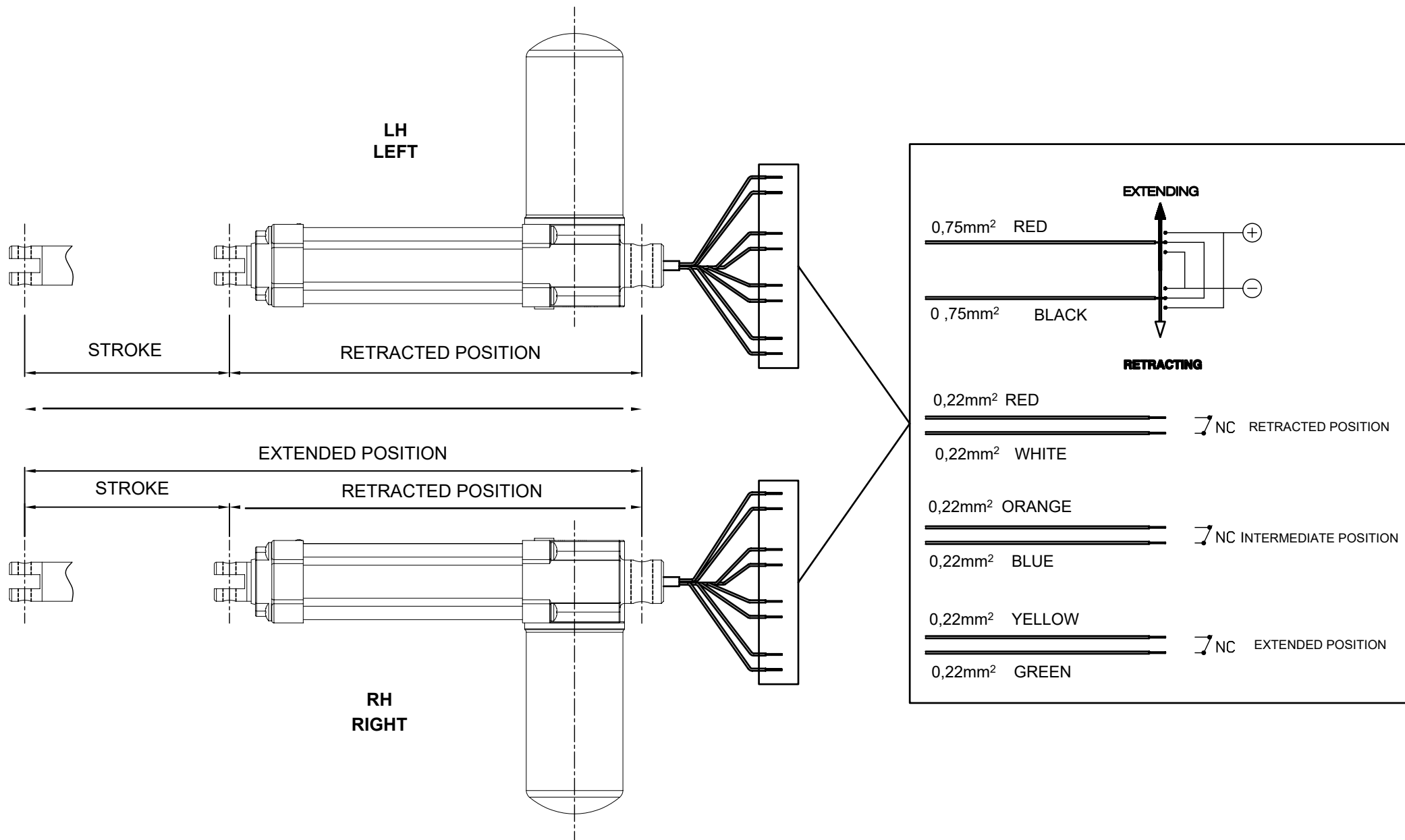
ACLE103	
ACTUATOR EQUIPMENT	SCHEME CODE
Motor DC	CA.31.01.70U
Motor DC + microswitches FC2 (NC)	CA.31.03.02U
Motor DC + microswitches FC2 (NO)	CA.31.03.18U
Motor DC + microswitches FC2 (CS)	CA.31.03.05U
Motor DC + microswitches FC2(NC) + GI2x	CA.31.03.60U
Motor DC + microswitches FC3 (NC)	CA.31.03.03U
Motor DC + microswitches FC2X	CA.31.03.01U
Motor DC + microswitches FC2X + NO	CA.31.01.63U
Motor DC + microswitches FC2X+FC3 (NC)	CA.31.03.04U
Motor DC + microswitches FC2X+FC3 (NO)	CA.31.03.20U
Motor DC + microswitches FC2X + GI2x	CA.31.03.72U

Table 10.2 – Wiring schemes of ACLE103

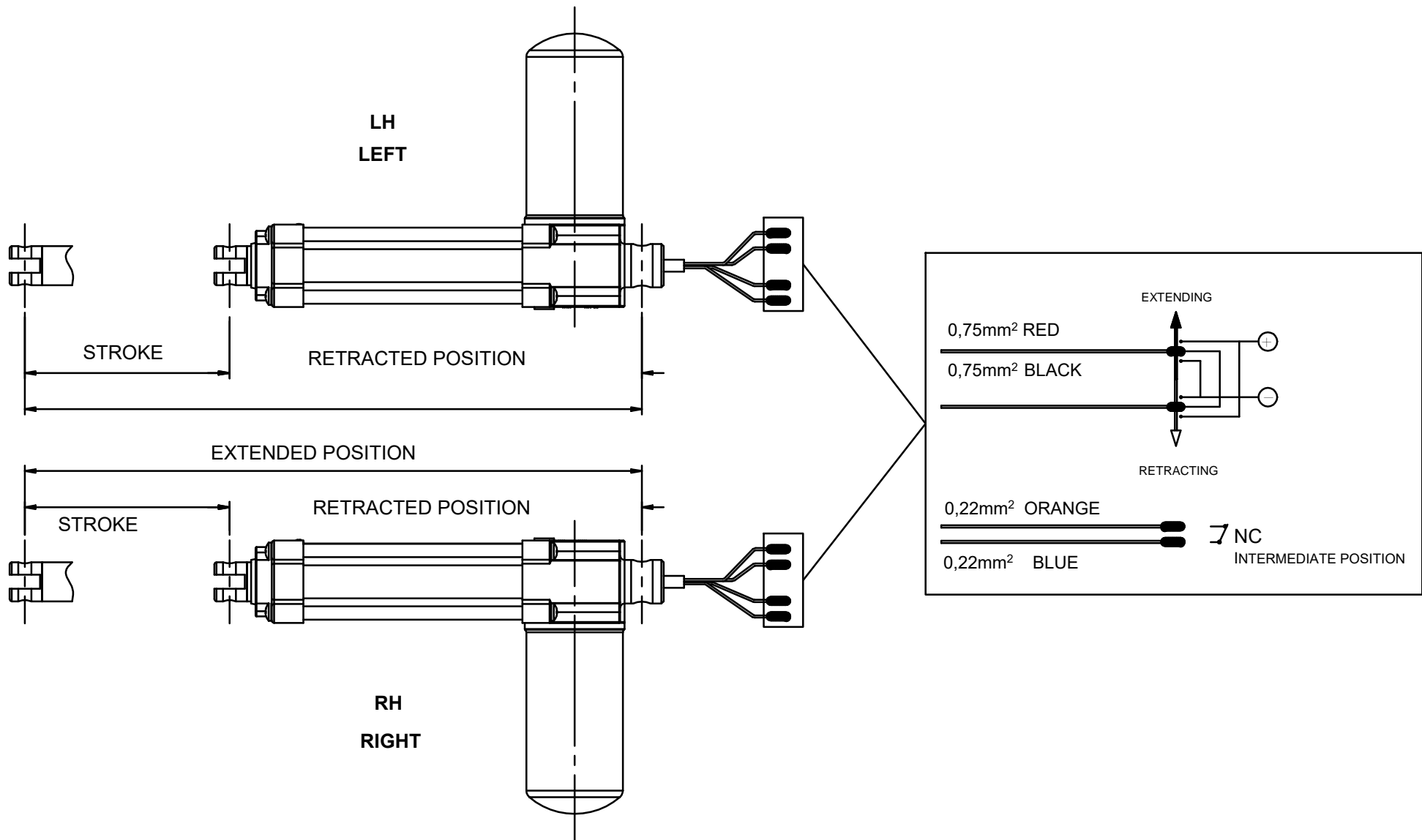




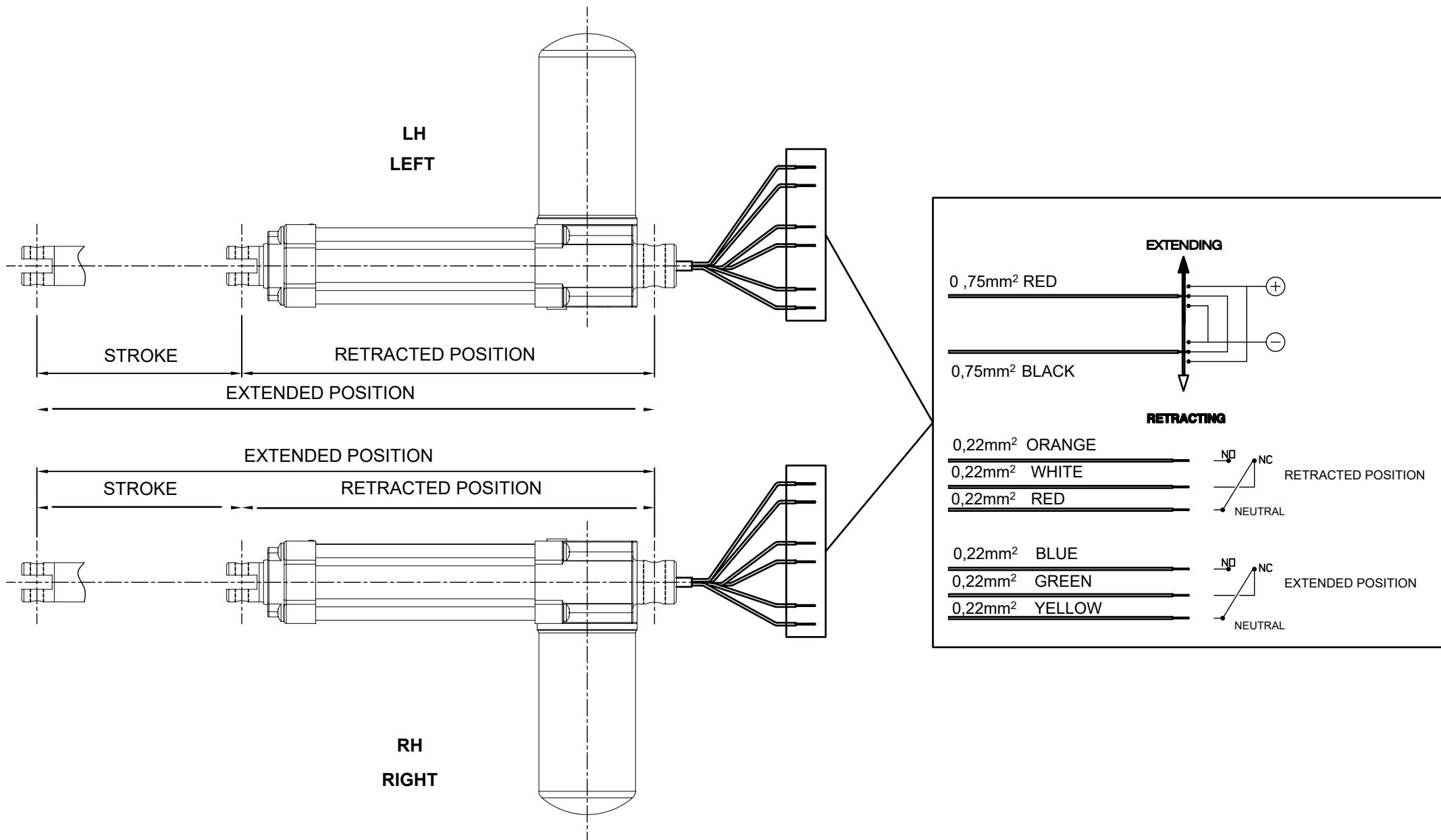
ACLE101 - Wiring diagram for DC motor + switches FC2 (NC)
CA.31.01.02U



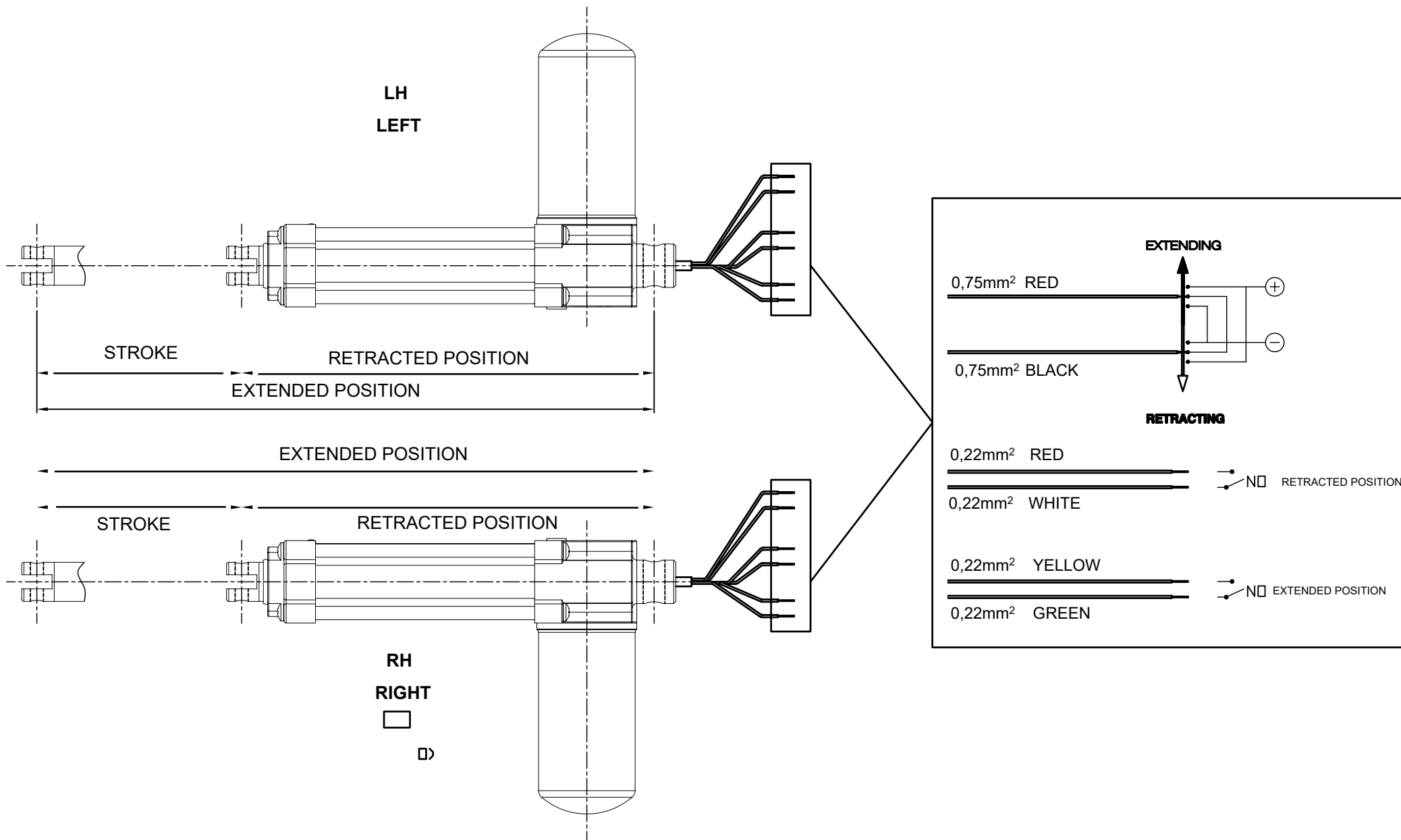
ACLE101 - Wiring diagram for DC motor + switches FC3 (NC)
CA.31.01.03U

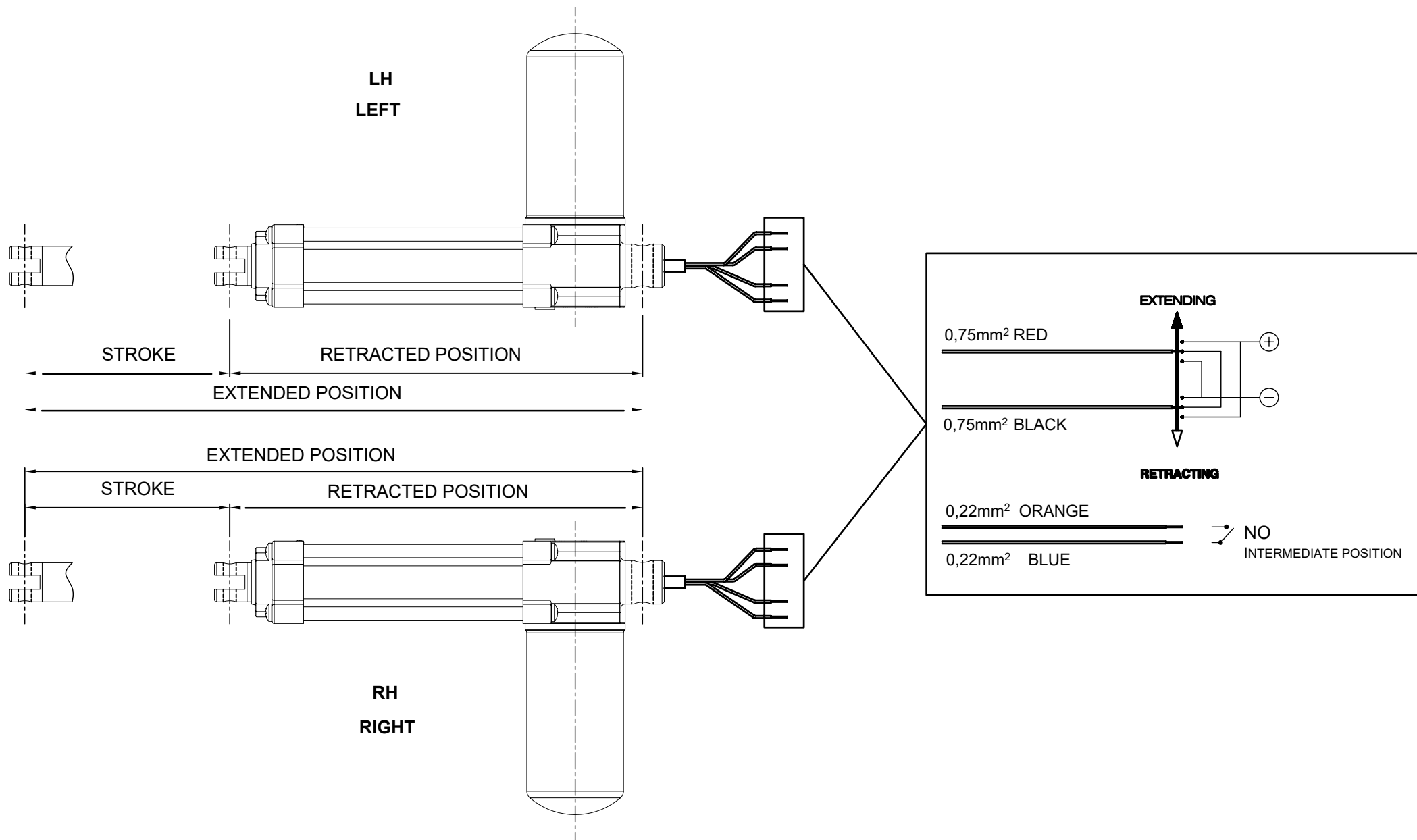


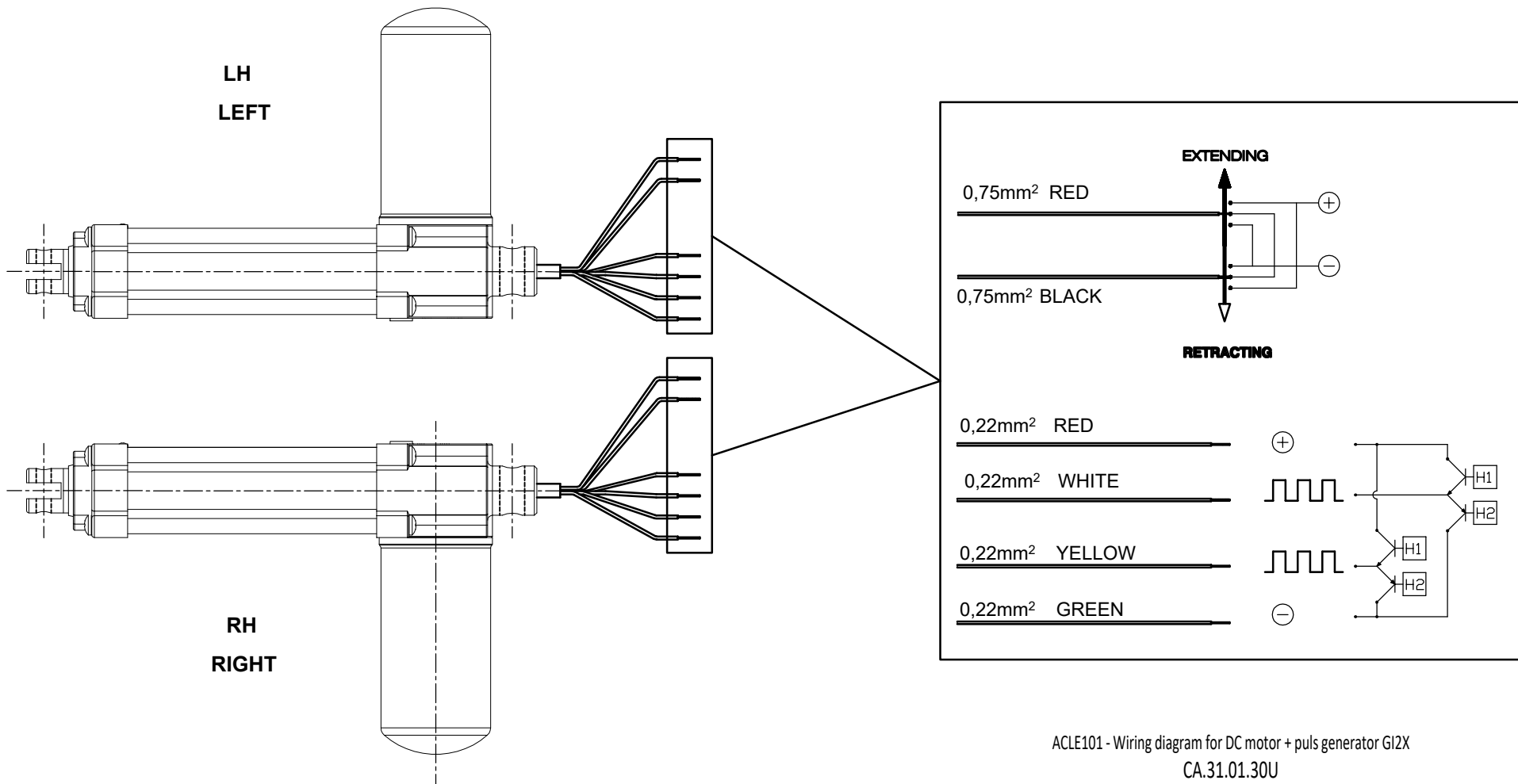
ACLE101 - Wiring diagram for DC motor + switches FC2X+FC (NC)
CA.31.01.04U

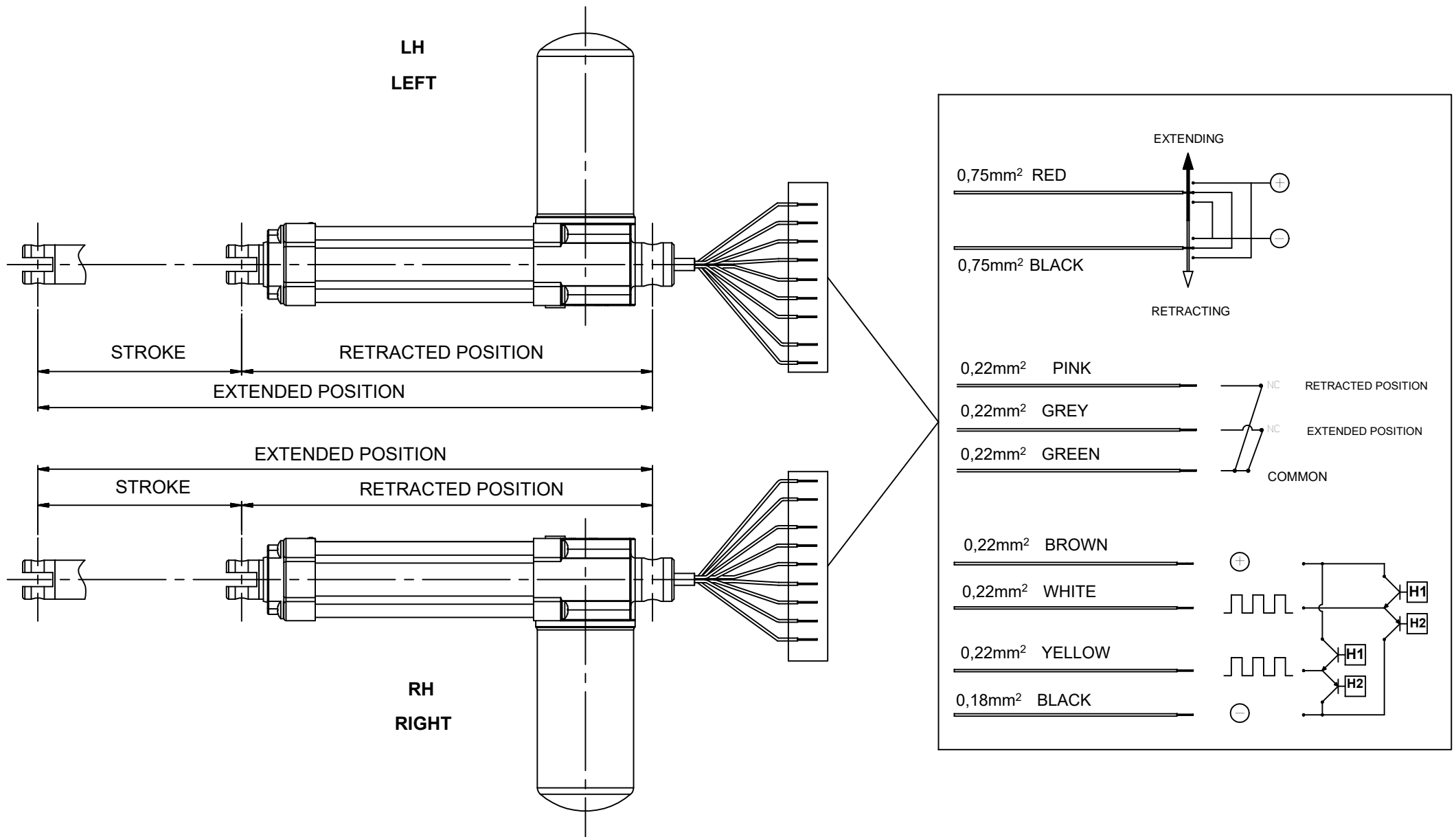


ACLE101 - Wiring diagram for DC motor + switches FC2 (CS - exchanging contact)
CA.31.01.05U

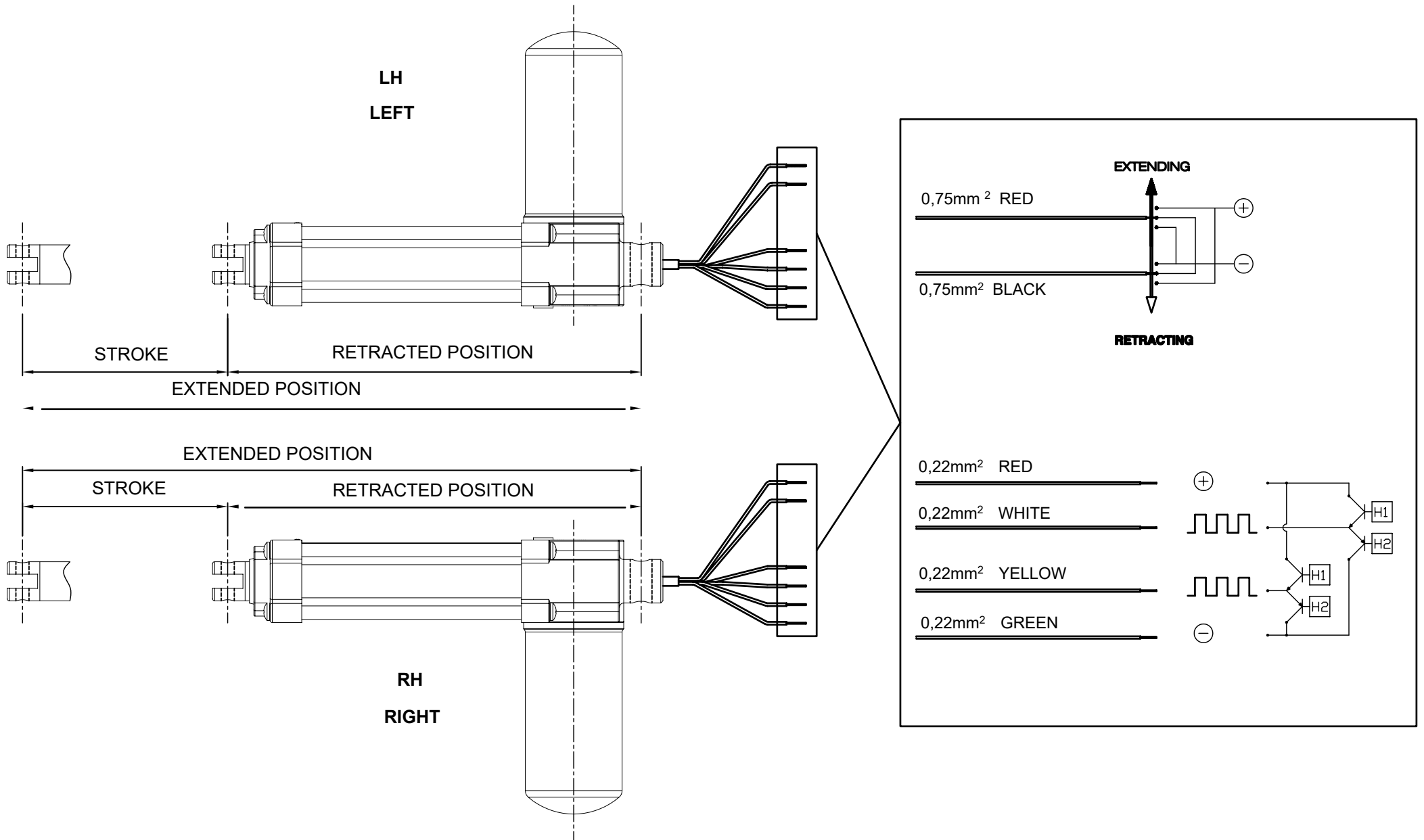


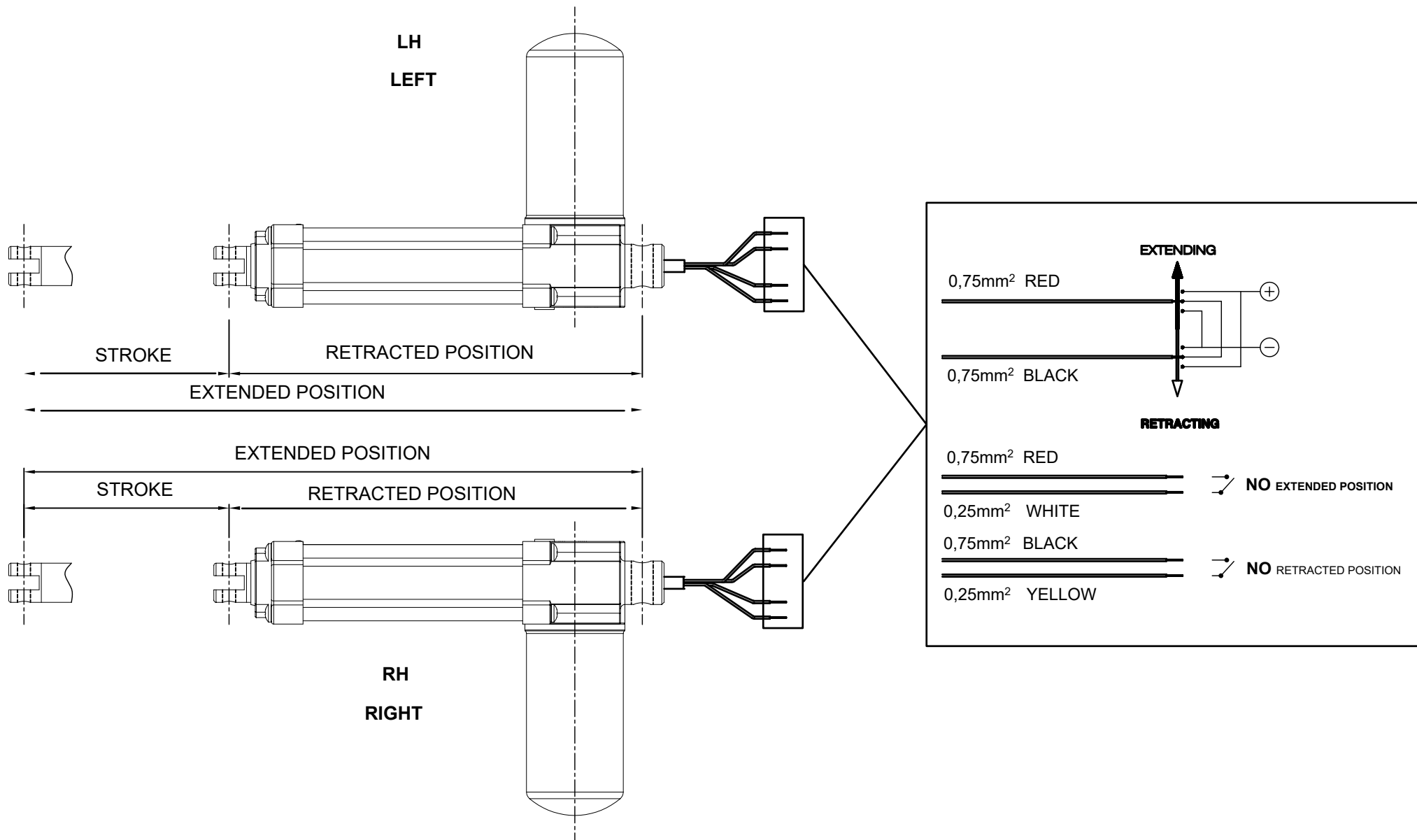


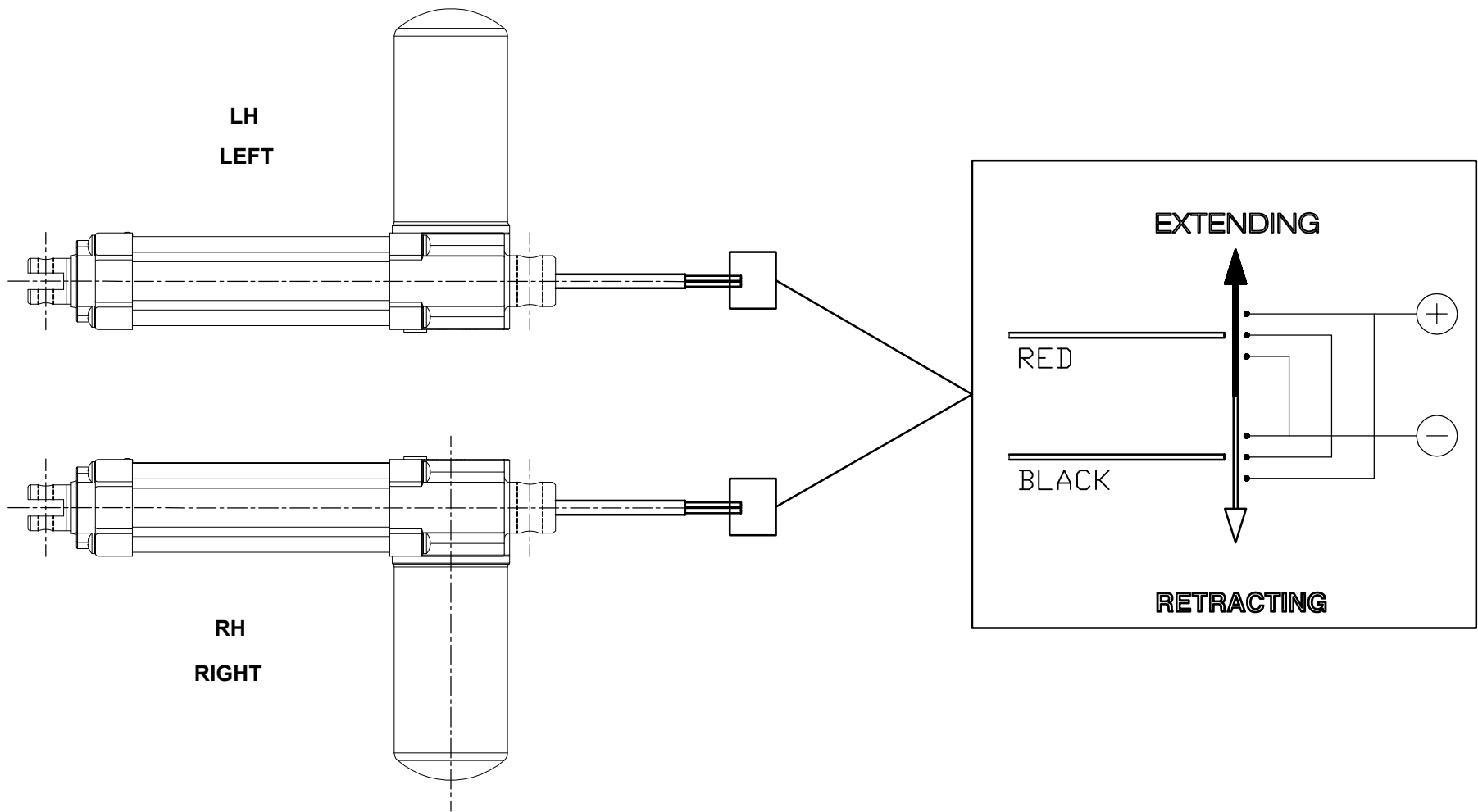




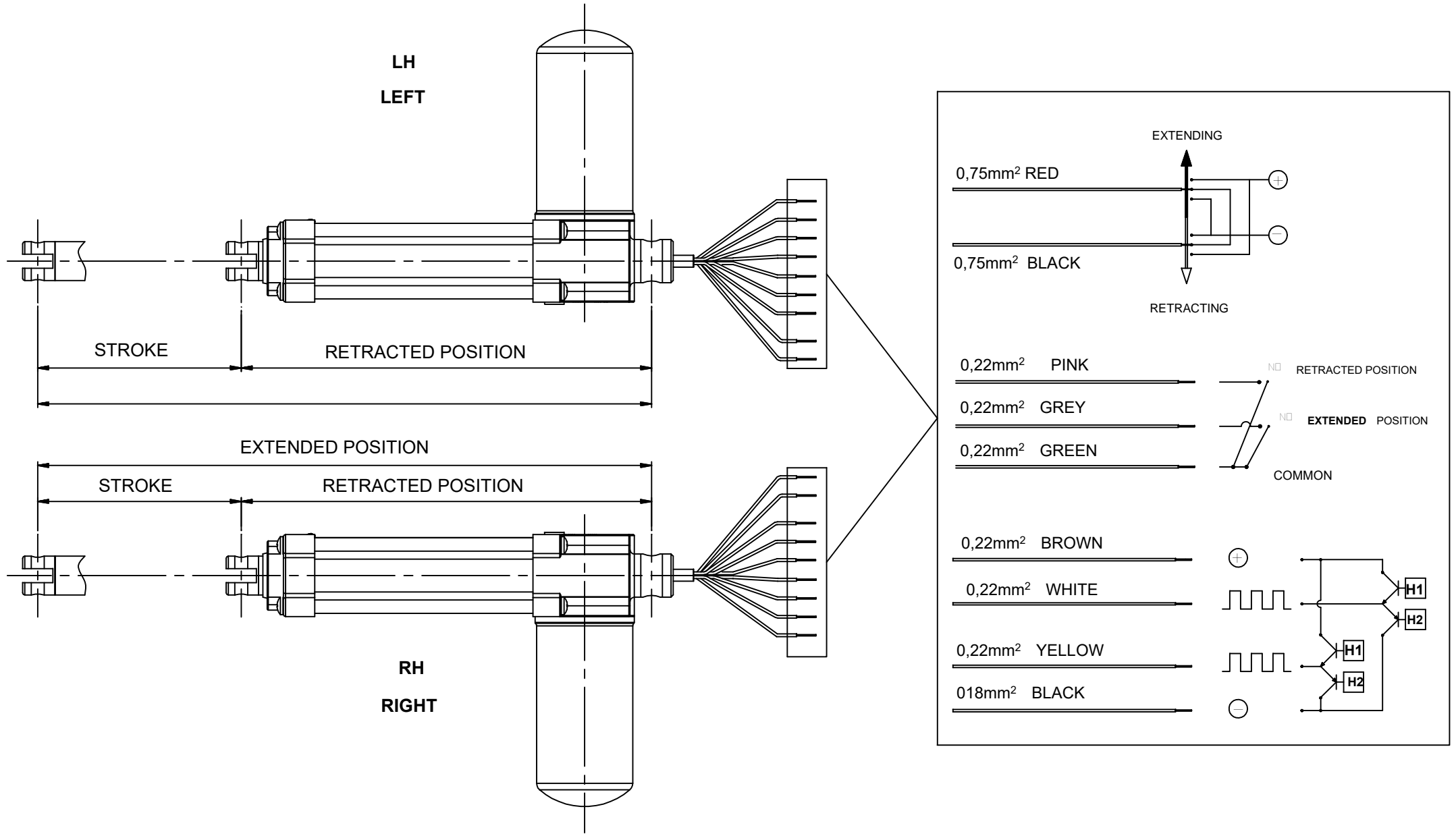
ACLE101 - Wiring diagram for DC motor + switches FC2(NC)+ G12X
CA.31.01.33nU

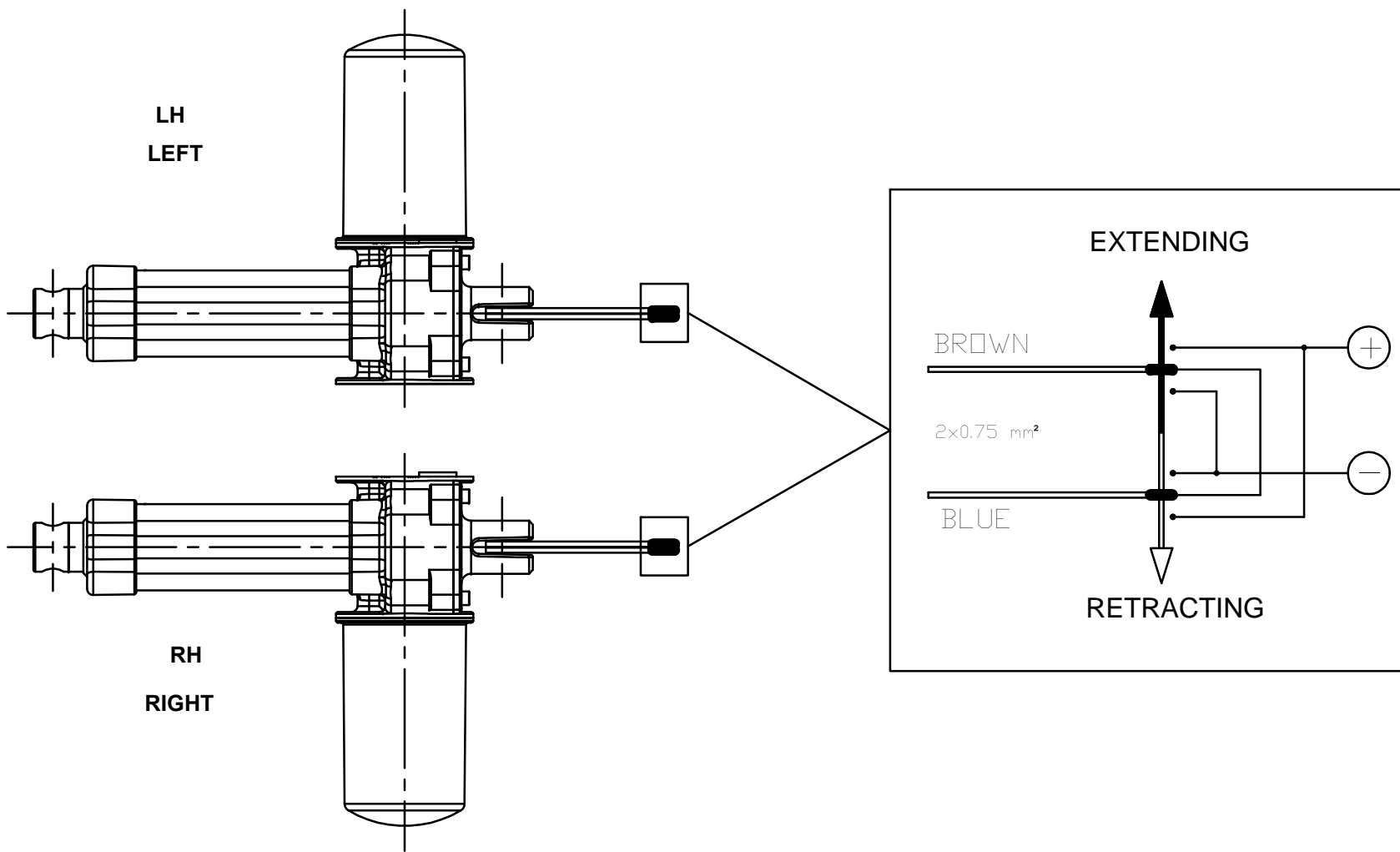




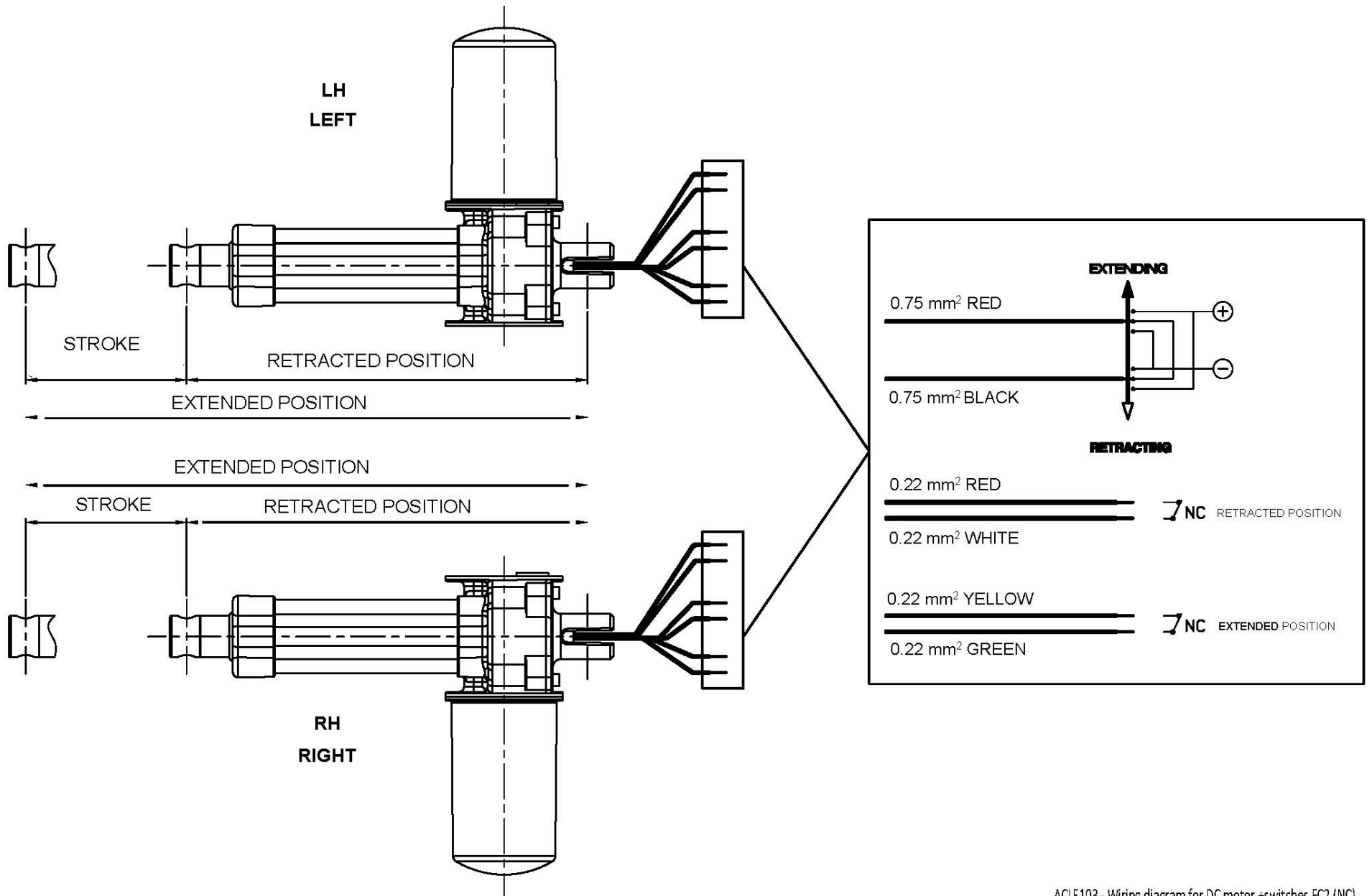


ACLE101 - Wiring diagram for DC motor
CA.31.01.70U

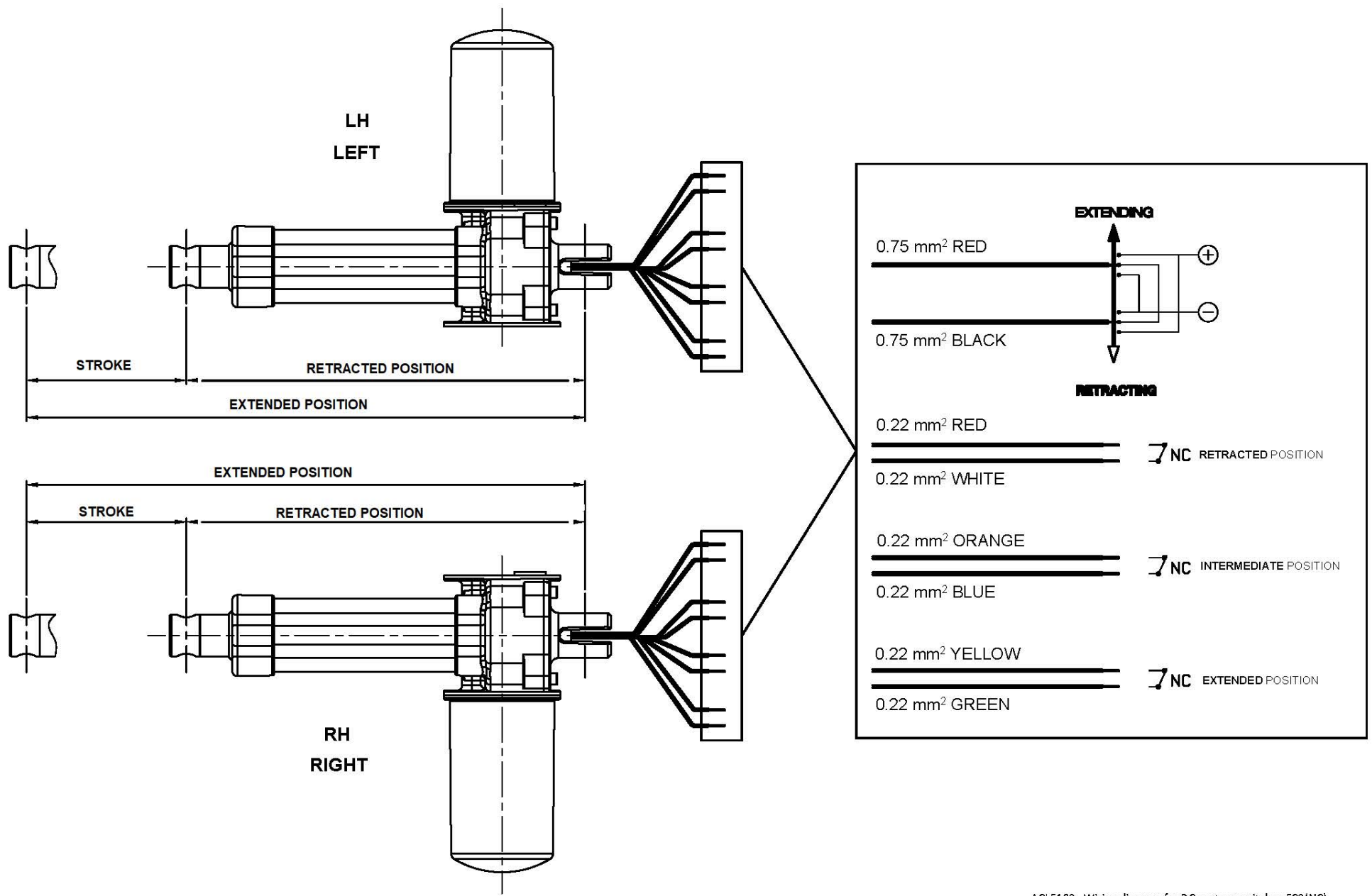




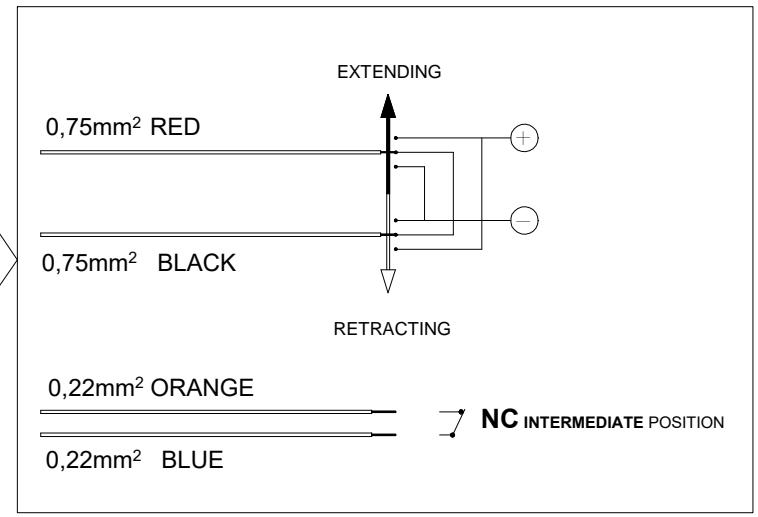
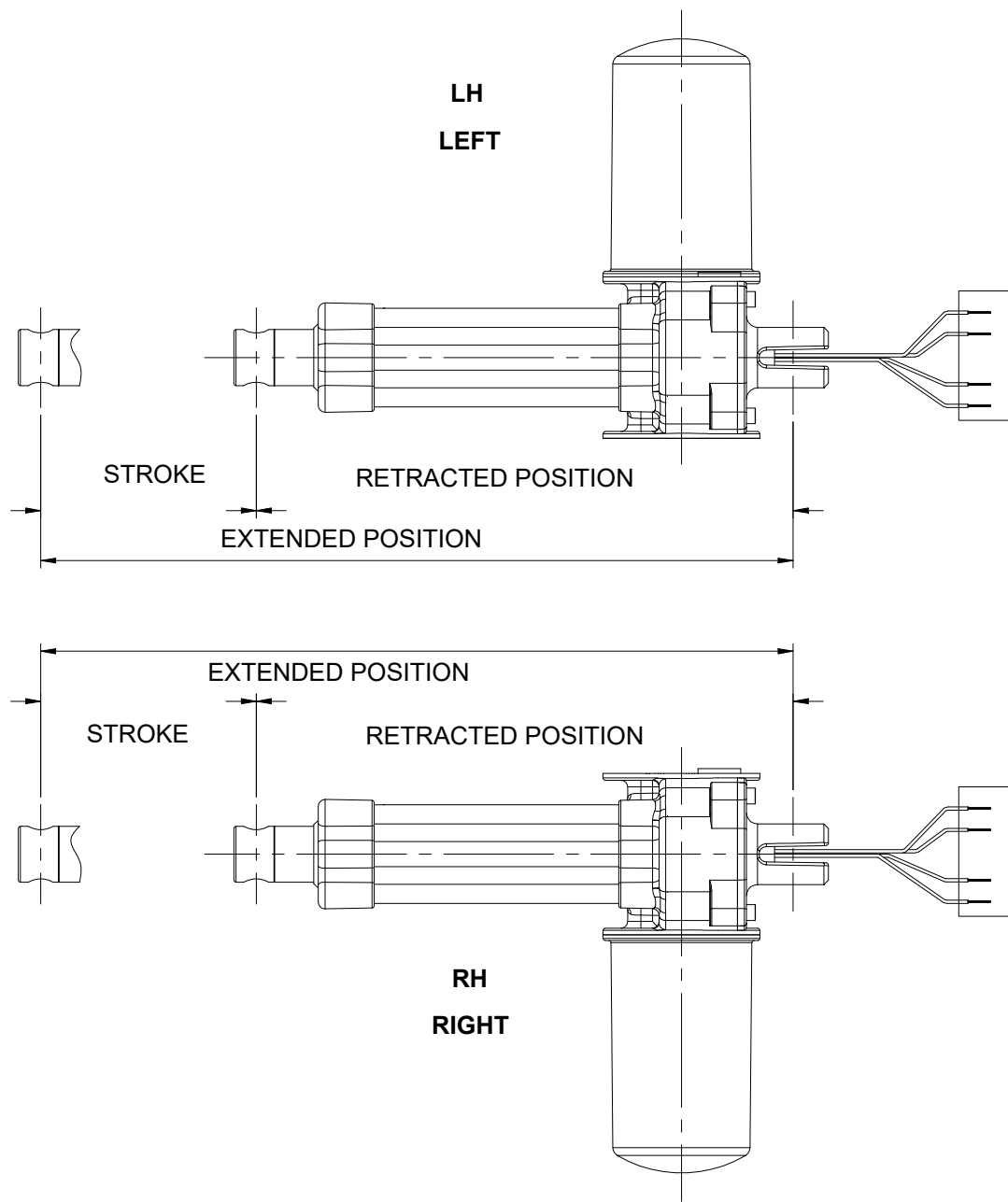
ACLE103 - Wiring diagram for DC motor +switches FC2 X
CA.31.03.01U

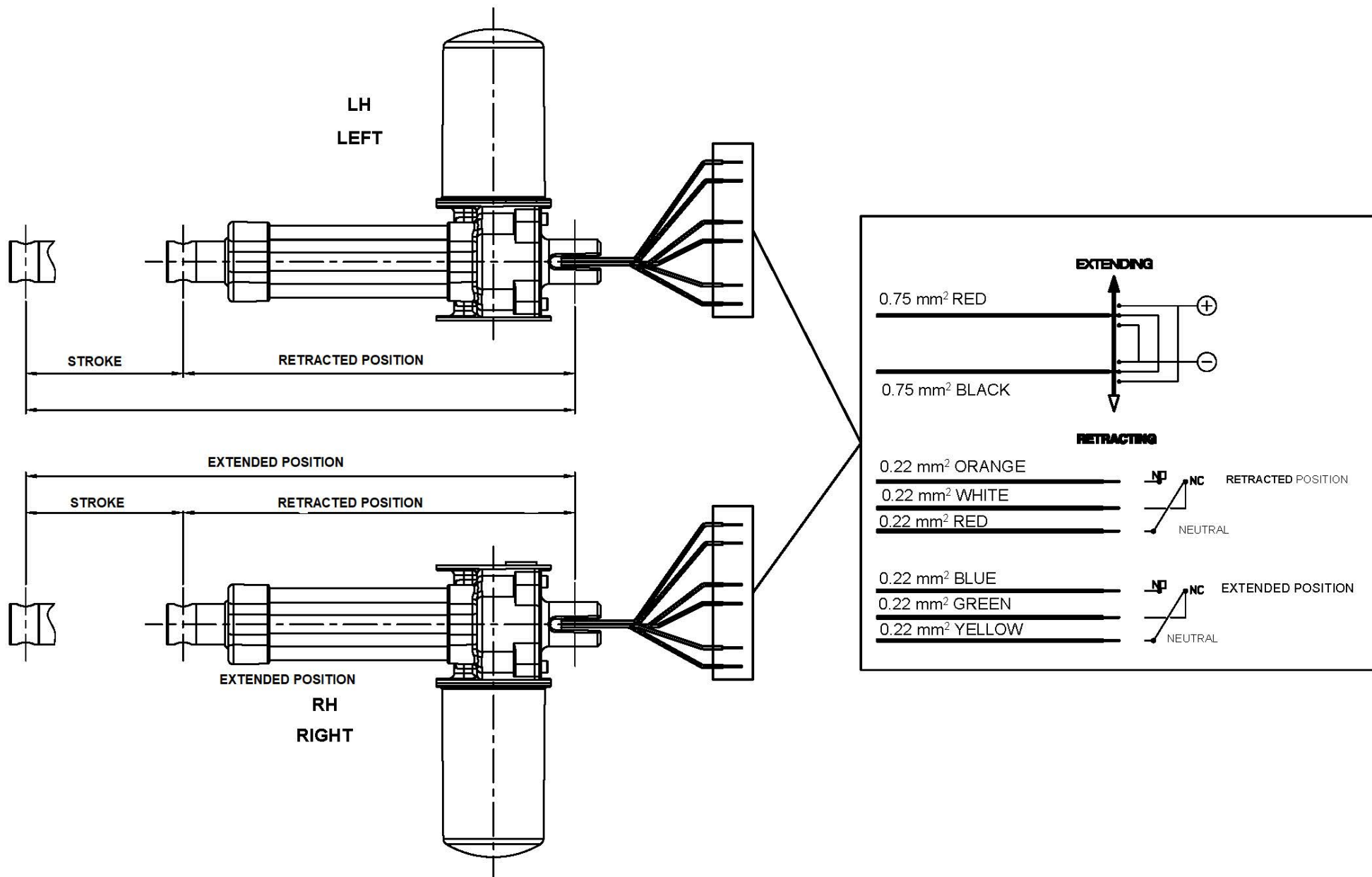


ACLE103 - Wiring diagram for DC motor +switches FC2 (NC)
CA.31.03.02U

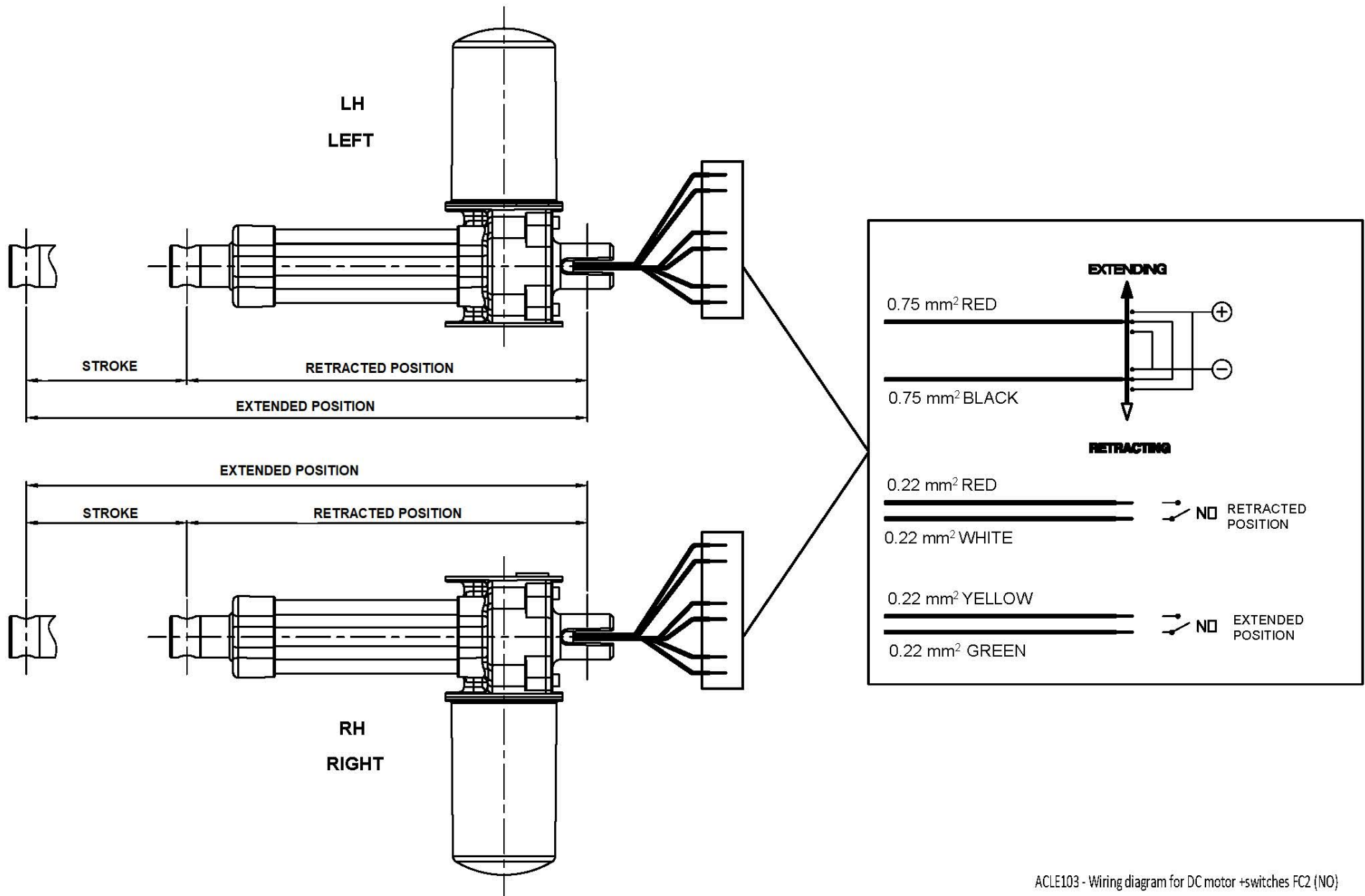


ACLE103 - Wiring diagram for DC motor +switches FC3(NC)
CA.31.03.03U

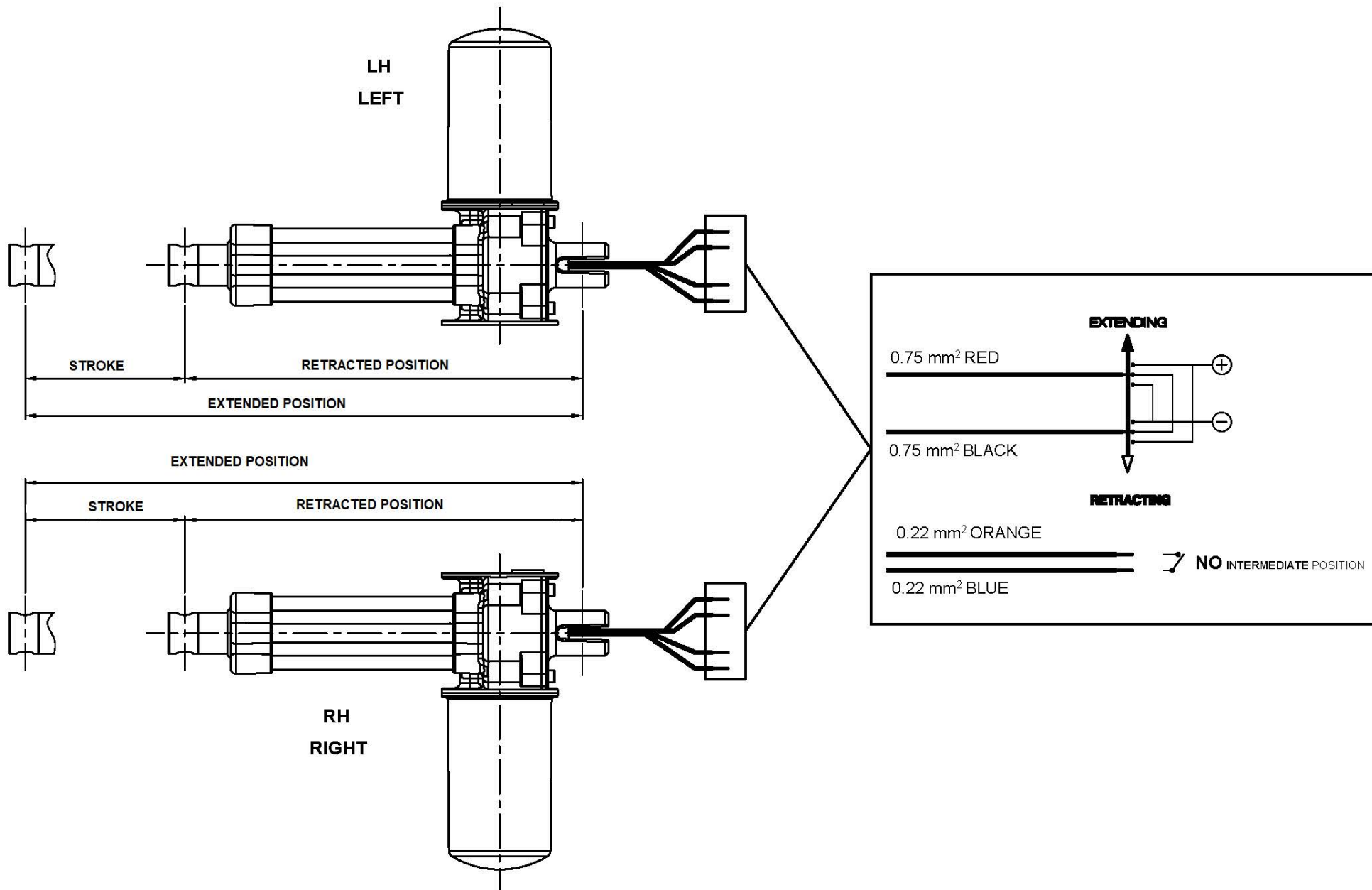


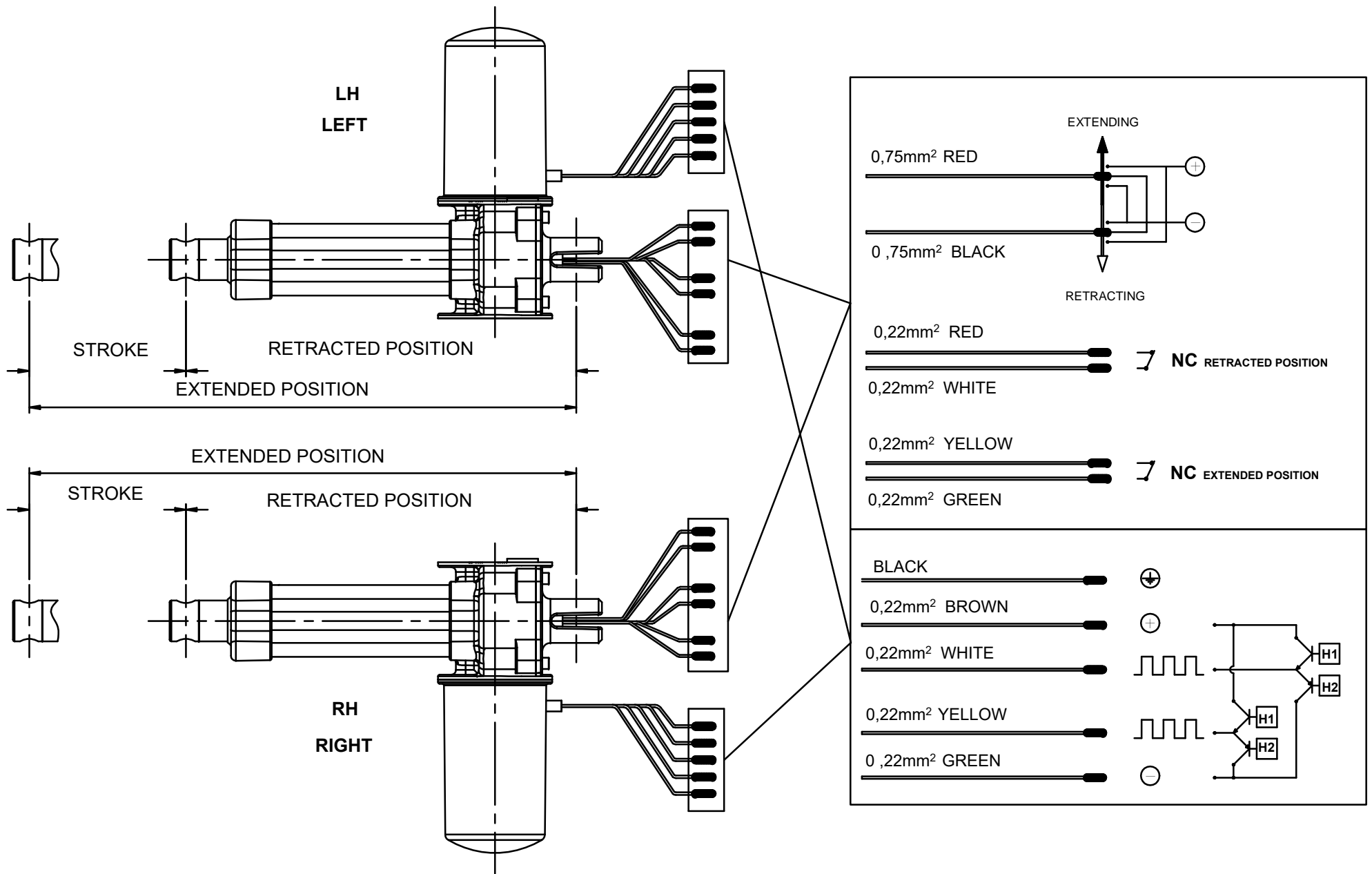


ACLE103 - Wiring diagram for DC motor + switches FC2 (CS - EXCHANGING CONTACT)

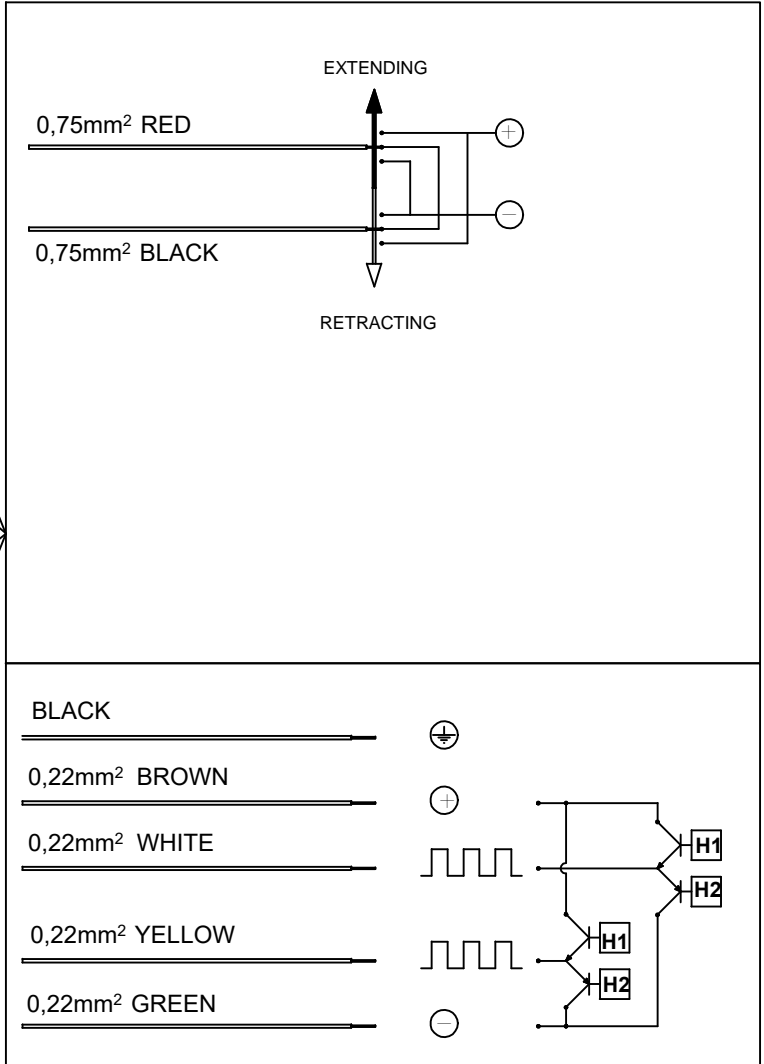
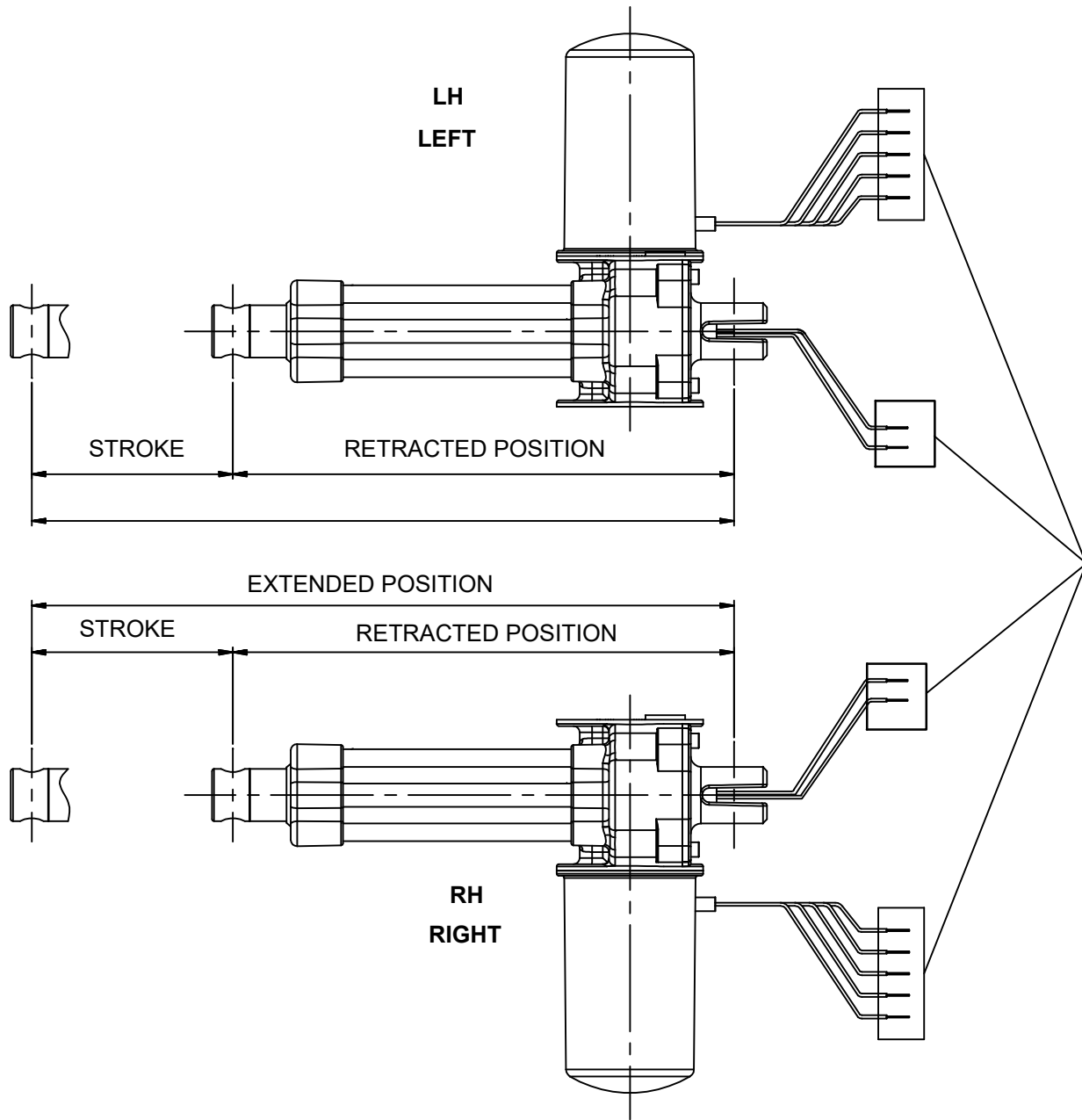


ACLE103 - Wiring diagram for DC motor +switches FC2 (NO)
CA.31.03.18U





ACLE103 - Wiring diagram for DC motor +switches FC2 (NC)
CA.31.03.60U





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