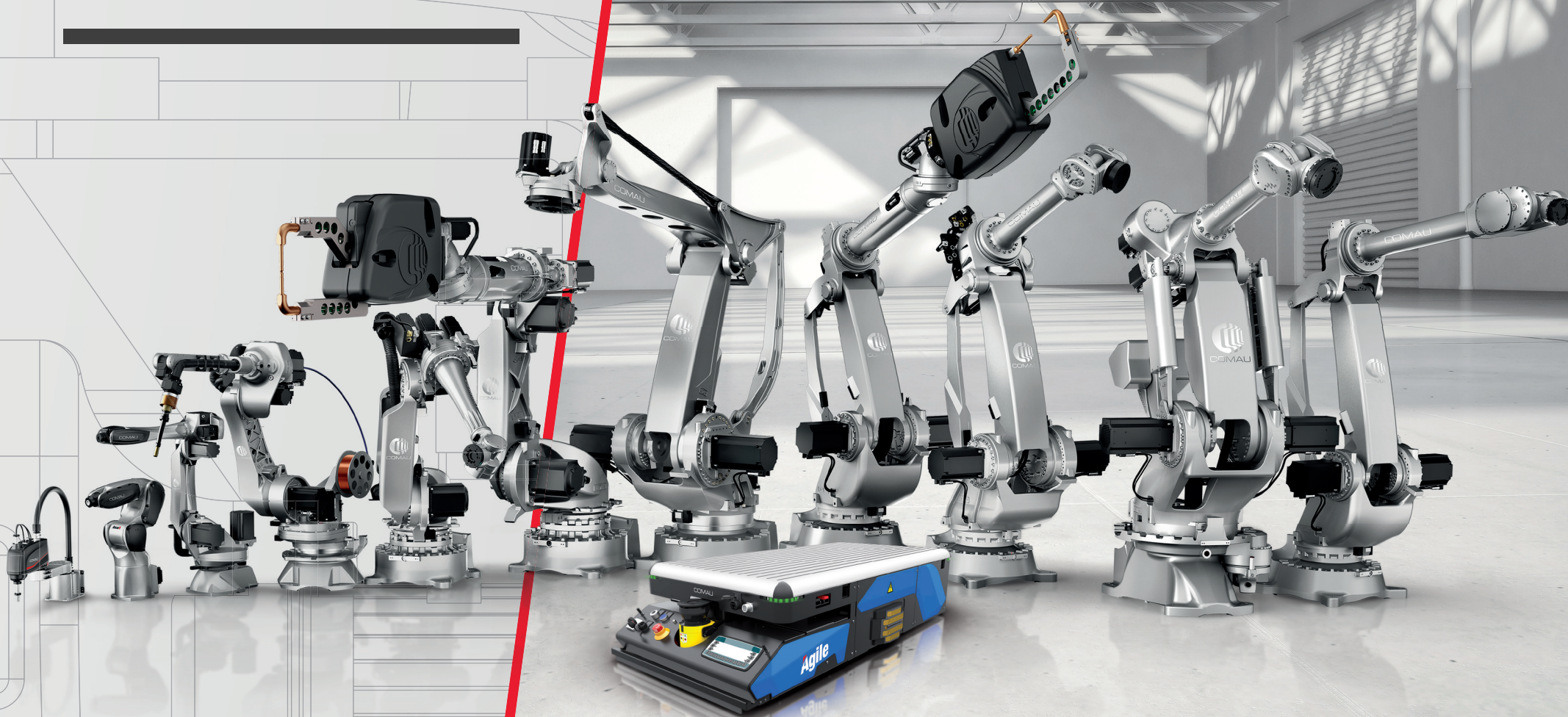


Customer Services





Our Customer Services

Our business is taking care of your business

Customer satisfaction is always a top priority of the Comau Robotics strategy.

We provide prompt and flexible service close to customers throughout the life cycle of their equipment. We offer a complete range of services to maximize the performance of Comau's solutions.

Training at either Comau Training Center or customer's sites with multi-language sessions.

On-line support with remote diagnostics and aids through Comau new robot control connection capacity.

Activities developed by experienced technicians at customer's site, delivery of spare parts, repairs and re-conditioning services and worldwide maintenance plans.



Offered Services





Spare parts and logistics

Professional consultancy and flexible solutions for your spare parts logistics and stock.

Support and management of parts, exchange units and repairs with a reliable response time in order to assure continuous production.



Training

Education and training with learning paths ranging from «basic» to «advanced» levels supplied at our Training Center, at the customer premises and with our new web-base interactive platform.

A complete training catalogue including basic use and programming, advanced programming, diagnostics and maintenance, application packages and more.



Technical assistance and agreements

Local teams to support customers, provide process reliability, improve product performances and maintain investment value.

Help Desk support, remote diagnostics and fault analysis by highly skilled engineers to support troubleshooting and address critical emergency situations.

A range of service agreement solutions to cover any specific need.



Advanced services, refurbishment and upgrades

Analysis of customer needs and process improvement packages that combine experience and knowledge with new technologies to enhance system performance or reconfigure existing applications.

Industrial engineering support, upgrades, new software versions and hardware renewal and reconditioning.

Spare Parts and Logistics

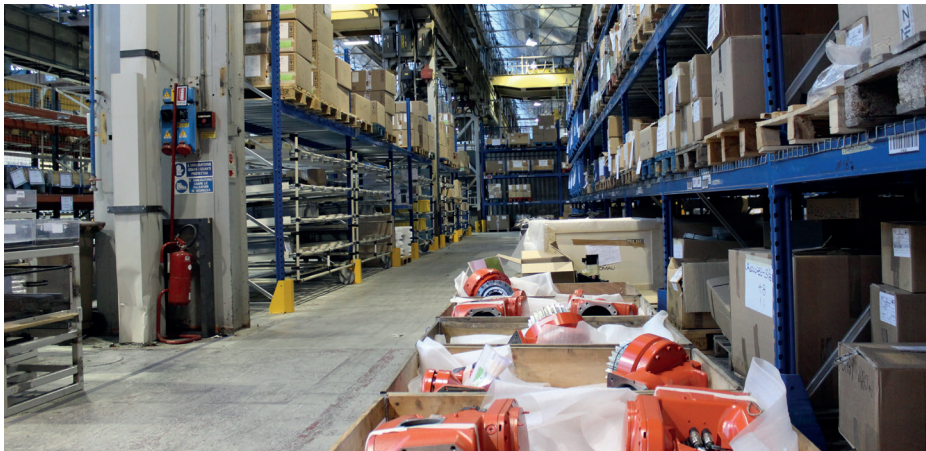


SPARE PARTS AND LOGISTICS

Spare parts and logistics

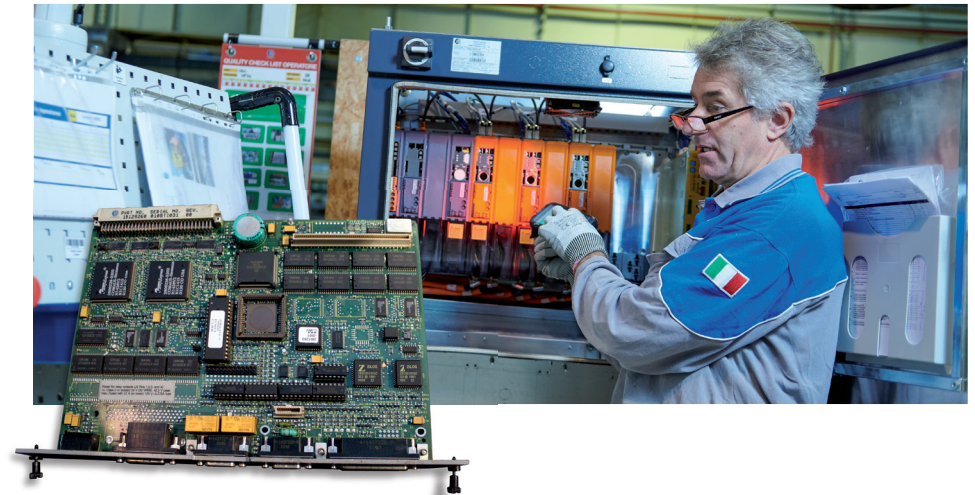
Introduction

- Spare parts and Repair services available for at least 10 years following the discontinuation of production
- HQ warehouse with 20.000 available items
- Special packages of recommended spare parts and/or consignment stock based on installed robot c/o the customers
- Full one year warranty on all spare parts
- Fast repairs via an exchange service



Robot arm spare parts

- Immediate availability of wrist, reduction gears and balancing groups
- Wrist repair and revision
- Reduction gear repair and revision
- Motor repair and revision
- Test benches for measurements and lost motion/backlash check



Electronic spare parts

- Electronic boards repair and complete revision
- Servo drive modules repair and complete revision
- Teach pendant repair and complete revision
- Software upgrades

Logistics

- Urgent delivery (within 24 hours in most Countries)
- Spare parts available directly in 12 Countries through local COMAU sites
- HUB Logistic Centers in Italy, Brazil, US and China

Go to www.comau.com/en/contacts and fill out the form on the **Customer Care** section: you will be promptly contacted by a spare parts manager to satisfy your request.

Training



A customised solution for effective results

Our course “Use and Programming” mixes consistently:

- Challenging practical activities
- Tools
- Theoretical content

We adopt an innovative learning methodology, combining classroom training, business experience and multimedia tools.

Solution 1: e-learning + in-person training

E-learning - to explore processes and behaviours, practice, reflect and receive feedback

- Theoretical content (videos, animations, texts)
- Practical content (exercises and simulations)
- In-depth analysis
- Test + feedback

In-person training - to share knowledge and practice on robotic systems

- Practical activities and real exercises in Comau offices
- Reflection and sharing with Comau experts

Solution 2: in-person training with multimedia

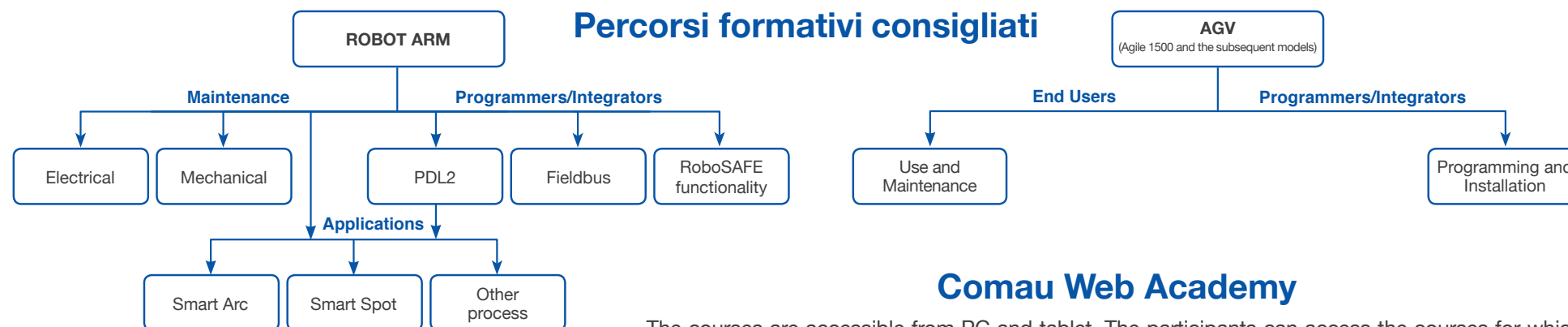
During the classroom training, the teacher and the participants can share contents, exercises and tests through multimedia tools (smart board, tablet and PC). This solution increases the involvement of the participants, who are active and share knowledge and experience.

Multimedia classroom - contents shared with multimedia tools

- Theoretical contents (videos, animations, texts)
- Practical contents (exercises and simulations)
- In-depth study
- Test + feedback

In-person training - to share knowledge and practice on robotic systems

- Practical activities and real exercises in Comau offices
- Reflection and sharing with the Comau experts



Comau Web Academy

The courses are accessible from PC and tablet. The participants can access the courses for which they are registered whenever they wish and can interrupt and resume the use of content according to their needs. Each course consists of a training part and an evaluation part (test) useful to verify the progressive learning of the content. At the end of the online course, a final test is scheduled and a certificate of attendance is issued. The material of each online course is available on the Comau Web Academy platform at the end of its utilization.

Technical Assistance and Agreements



A global team to serve local needs

L'assistenza tecnica is committed to support customers throughout the entire product life cycle of a robot by providing:

- Installation, commissioning and programming support
- Preventive maintenance, auditing and consultancy services to extend the Mean Time Between Failure (MTBF)
- Help Desk support, Remote Monitoring and Response Time services to reduce downtime (MTTR)

Go to www.comau.com/en/contacts and fill out the form on the **Customer Care section**: you will be contacted by a Seller to illustrate the training course most suited to your needs.



A complete Agreement Portfolio to meet the specific requirements of each single customer

Available agreement options

- Help desk from 8:00 to 17:00
- Intervention within 24 hours (6-12 optional), Italy restricted availability, one solar year
- Prepaid technical assistance hours packages (16 or 48) hours within one solar year
- Special discount 20% for maintenance during February-May and October-November
- Special discount: 10% off spare parts and 5% off repairs
- Optional refurbished spare parts (around 50% less expensive) depending on availability
- Shipping spare parts within the same day if order is made before 13:00
- Battery/Fan/Oil replacement packages: replacement advised every 2-3 years
- Warranty extension on Robot 1-3 years
- Warranty extension on Spare Part 12-18 months on service intervention (standard 6 months)
- “Slim” Warranty option (50% discount on spare parts during service intervention) - 1 year coverage
- IoT (Internet of Things) Remote monitoring - tool & service

Preventive Maintenance



Preventive maintenance

The purpose of **preventive maintenance** is to maintain the efficiency of the robot over time by retaining its original integrity.

This helps to eliminate production stops caused by the failure to execute controls and calibrations that together form the basis for efficient operation.

To achieve this objective, Comau offers a set of maintenance agreements, tailored for the entire robot family, including the careful control of mechanics and electronics.

A planned and scheduled preventive maintenance enables the identification of malfunctions and critical parts in need of replacement, which could compromise the reliability of the entire production line.



Typical maintenance

ROBOT ARM - Annual activities

- Check calibration position
- Check backlash and lost motion
- Visual check of lubricant leaks
- Check wiring harness
- Clean calibration references
- Clean robot
- Reset recovery position
- Specific intervention (depending on the Robot model)
- Fill out the maintenance card with relevant observations

ROBOT ARM - Every 3 years activities

- Replace gearbox lubricants
- Replace thrust bearing lubricant
- Grease bearings
- Specific intervention (depending on the Robot model)

ROBOT CONTROLLER C5G/C4G - Annual activities

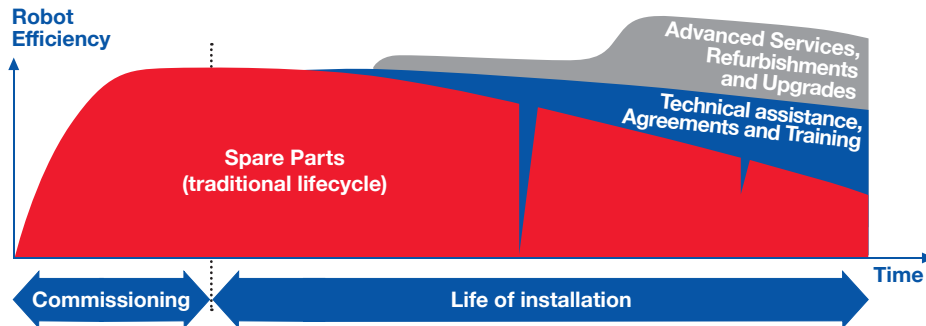
- Save user programs on USB
- Check fans and clean cooling system
- Control emergency button on the TP / on the Control (C4G)
- UPS & APC battery check (C5G) / CU battery (C4G)
- Check grounding strips
- Control connections, clamping connectors and screws
- Control main voltage (380/500 V +/- 15%)
- Control SDM voltage (C5G) / APS and FIA board voltage (C4G)
- Control NET filters voltages
- Check dial functionality of the TP
- Check selector functionality on TP
- Check general integrity of the system (C5G or C4G)
- Fill out the maintenance card with relevant observations

Advanced Services, and Refurbishments

Comau Services is always by the Customer's side to identify and implement innovative upgrades and refurbishment solutions to improve efficiency throughout the product lifecycle.



ADVANCED SERVICES, AND REFURBISHMENTS



A refurbished robot is a used robot that has undergone an overhaul to return it to its original condition.

This procedure prolongs its operational lifetime.

After careful inspection, each robot is load tested for twenty-four hours.

Refurbished robots are guaranteed 12 months after shipping date.

- Process improvement projects (in terms of Performance Efficiency and Cycle time)
- HW and SW upgrade
- Robot configuration upgrade
- Consultancy services
- Relocations and end-of-life services (Refurbishment)
- Total cost of ownership reduction
- Used Robot sale



Components to be refurbished

Application loom and wiring harness replacement



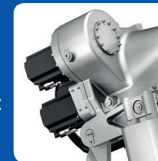
Wrist revision



Always

As necessary

Axes 4-5-6 gearboxes replacement



Spring bearings replacement



Axis 3 gearbox replacement



Axis 3 motor revision

Axis 2 motor revision



Axis 2 gearbox replacement

Axis 1 thrust bearing replacement



Axis 1 gearbox revision



Lubrication & backlash check

Visual inspection of all parts



Upgrades



MTPReel™ Multi Teach Pendant Reel

MTPReel™ is a functional spring-driven cable retraction system for teach pendants. It guarantees tidiness and safety in the workplace. Reducing cable exposure to the environment also guarantees cable neatness, life extension, protection and potential reparation cost savings.

MTPReel™ competitive advantages

Comau's MTPReel™ - Multi Teach Pendant Reel system benefits:

- **Safer work area**

Cable doesn't stay on ground or become misplaced. Reduced risk of walking on the cable or getting caught in it. No accidents due to tripping hazards or contact with the electrical parts of exposed wires in case of cable damages.

- **Simplified maintenance**

Inside MTPReel™ the cable doesn't get dirty or wear out. Rewind simplicity reduces operator intervention for cable storage and robot stops/recoveries. Reducing cable exposure to the environment guarantees cable neatness, life extension, protection and potential reparation cost savings.

- **WCM and KAIZEN rules compliance**

Workplace order, organization and security can increase plant ranking by complying WCM and KAIZEN rules.

- **Multiple installations**

It can be installed in complete robotics lines.

- **Tested and reliable solution**

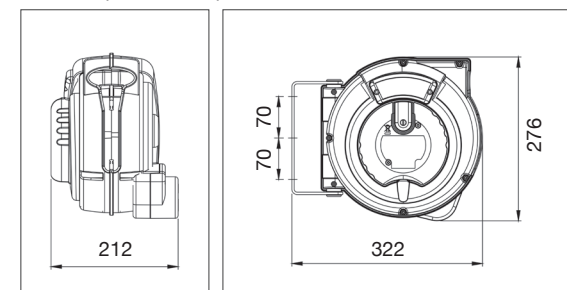
MTPR has been also tested to minimize noise frequency on cables and to reduce signal loss.

MTPReel™ specifications

- Compact housing made of shockproof plastic.
- Automatic cable locking element inserted every 50 cm.
- Cable with high-strength polyurethane coating is extremely adaptably, hardly inflammable and resistant against twists, oils and coolants..
- Cable guide roller facilitates cable rewind.
- Steel fixing bracket with pivot which allows adjustments in both retreat and extraction directions.
- High resistant spring recovery.
- 10 mt and 20 mt. 2.5 mt fixed.
- Ground contact.
- Integrated brake to limit retraction speed.
- Complies with standard UNI EN ISO 13849-1 e 2, CEI EN 60204-1, UNI EN ISO 10218-1, EN 61242-A1.
- Filter to clean the cable.
- Internal shielding against electromagnetic fields.

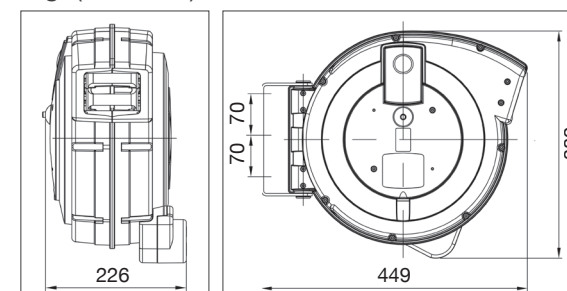
10 m Version

Small: (H x L x P) 322 x 276 x 212



20/25 m Version

Big: (H x L x P) 449 x 382 x 226



Codice	Descrizione
CR10149480	Cable Reel MTPReel™ for COMAU TP4i/WiTP Wired (C4G) ITP (C5G) 10m
CR10149481	Cable Reel MTPReel™ for COMAU TP4i/WiTP Wired (C4G) ITP (C5G) 20m
CR10149482	Cable Reel MTPReel™ for COMAU TP5 (C5G) 10m
CR10149483	Cable Reel MTPReel™ for COMAU TP5 (C5G) 20m
CR10149484	Cable Reel MTPReel™ for COMAU TP5 (C5G) 25m

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