ITALPLANT
transfer systems

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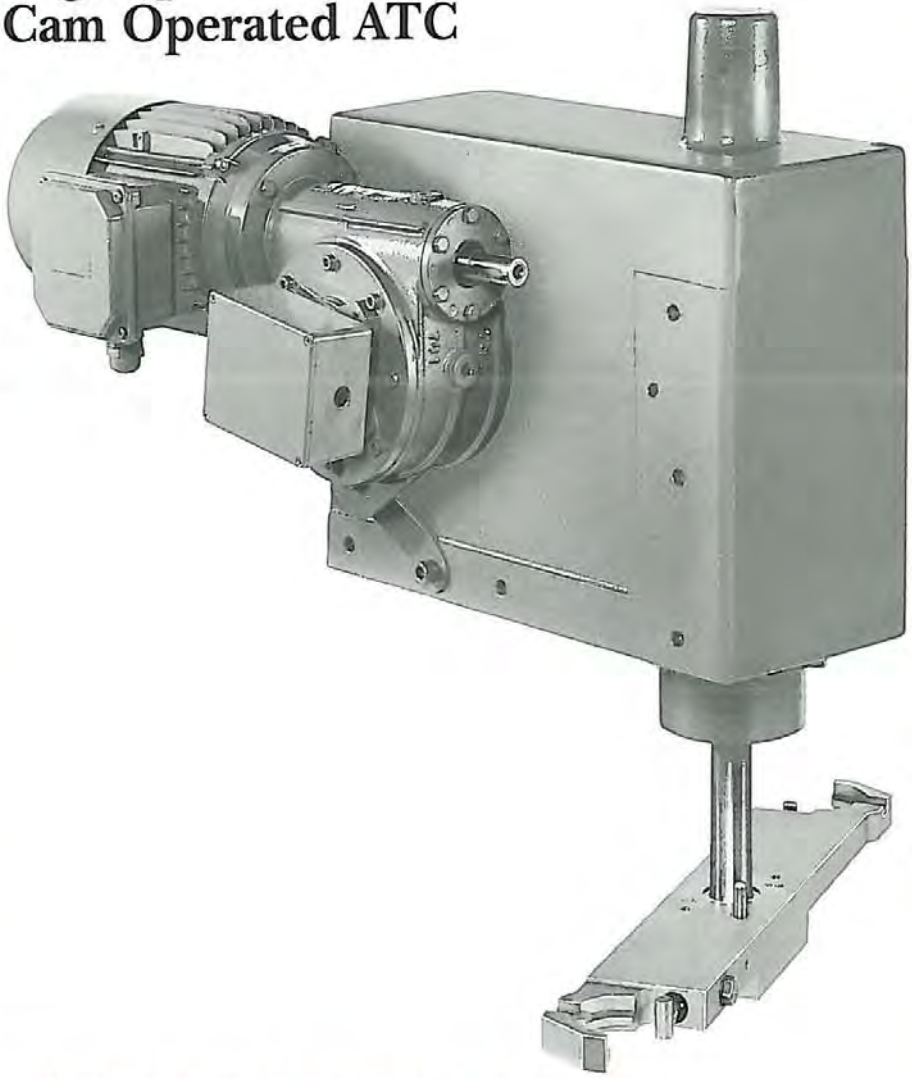
Tool changers

ITALPLANT

High Speed Globoid Cam Operated ATC



SIZE 40 AUTOMATIC TOOL CHANGER

- 1.0 to 1.6 seconds operating time
- Tool and holder weight up to 7kg (at 240mm radius)
- Built in overload protection
- Motor Brake release with manual rotate facility
- High positional accuracy and repeatability
- Cam controlled velocity and acceleration
- Lubricated for life

High Speed Globoid Cam Operated ATC

ITALPLANT HAS FOR MANY YEARS APPLIED CAM MOTION TO A WIDE VARIETY OF APPLICATIONS

In this application our experience has been used to increase the productivity of machine tools by reducing the time taken to change tools between operations.

DESCRIPTION OF OPERATION

During each cutting operation the tool magazine is indexed to present the next tool to be used at the change-over point. When the cutting operation is completed the machine head is moved to *its* change-over point and the spindle is programmed to stop with the cutter drive dogs in the correct orientation for tool removal.

STEP 1: HOME

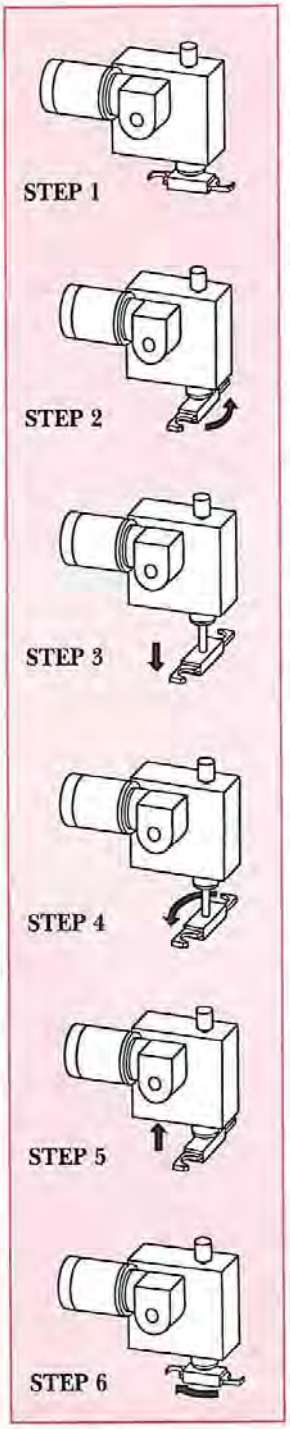
At this point the tool change cycle is started.

STEP 2: SWING/TOOLS ENGAGED

The tool arm moves from its rest position, rotating 90° to engage both the new and old tools in "claws". The claws have dogs which engage with the driving dogs of each tool and prevent the rotation of tools during exchange. Spring loaded plungers locate the tool in its claw.

STEP 3: TOOLS LOWERED

The tool in the machine tool spindle will be retained, possibly by a stack of disc springs which must be compressed in order to release the tool. A motorised, cam driven "knock-out" unit is available from Manifold to release these springs. This "knock-out" unit is energised by a signal from the tool changer and the tool is released into the claw of the tool change arm. The tool changer lowers the tool change arm with the two tools.



STEP 4: TOOLS DOWN BEING EXCHANGED

As the arm moves down spring loaded plungers are released which firmly lock the tool into the claws in readiness for the rapid tool change-over.

The arm lowers the tools by a total of 110mm and then rotates through 180° thus exchanging old and new tools.

STEP 5: TOOLS REPLACED

The arm then rises, inserting the tools into their respective holder and machine tool spindle. When rising the last few millimetres the positive lock on the tool locating plungers is disengaged.

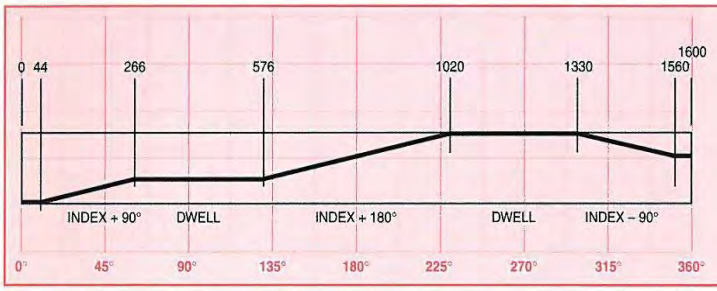
STEP 6: RETURN TO HOME

The "knock-out" motor is energised once more, the draw-bar springs are released and the new tool retained in the machine tool spindle. The tool change arm then returns through 90° to its rest position.

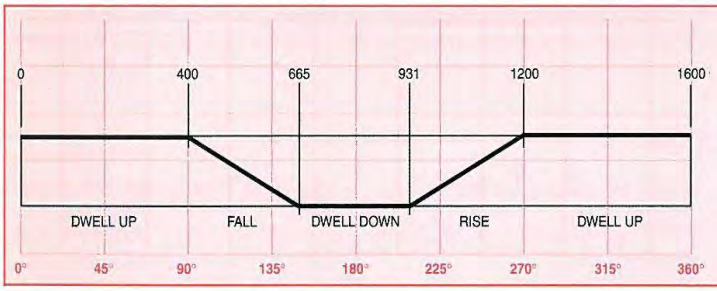
The whole operation can be performed with light tools in 1 second, with maximum weight tools (7kg) in 1.6 seconds. If the machine tool controller carries information concerning the weights of each of the tools in the magazine, and the tool changer is powered via a frequency inverter the maximum benefit can be obtained by changing speeds according to this criterion.

TIMING DIAGRAM (ALL TIMES ARE VARIOUS POINTS FROM START. FIGURES IN MILLI-SECONDS).

KNOCKOUT MOTION



SWING



VERTICAL

TOOL CHANGER

The design of the tool changer mechanism has been proved over a number of installations.

The design of the housing can be modified to accommodate left or right hand magazines or other minor mounting variations.

The drive to the tool changer is normally by shaft mounted gear unit with integral slipping clutch to reduce the risk of damage to the unit in the event of a jam-up.

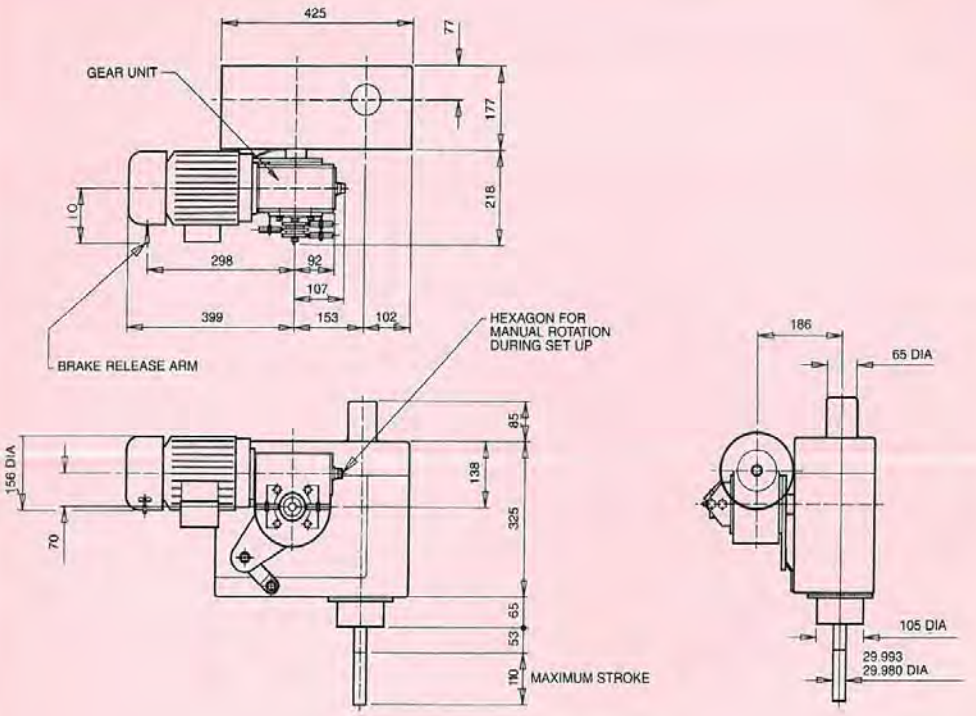
The brake motor is fitted with a hand release and the gear unit has an extended worm shaft which can be used together to turn the unit manually during setting up procedures.

The drive arrangements are adaptable to suit customer requirements and the unit can be provided with belt drive input if space is limited.

FEATURES AND OPTIONS

- **Plain output shaft** for compression fitting to allow easy set up.
- **Mounting details** – adapted to suit the customer requirements.
- **Tool Changer** – lubricated for life – harden steel cam.
- **Gear Unit** – lubricated for life – slipping clutch – extended worm shaft.
- **Brake Motor** – with hand release.
- **Proximity Switches** – stop signal and knock-out start signals.

AUTOMATIC TOOL CHANGER INSTALLATION DIAGRAM



OTHER ASSOCIATED PRODUCTS:

ITALPLANT MAGAZINE DRIVES

Tool magazines can take a variety of forms, the most common are Rotary Table and Conveyer Link types. ITALPLANT can provide cam driven indexing mechanisms to drive such magazines. They incorporate overload devices which can avoid damage to the magazine or its drive in the event of a jam-up.

ITALPLANT PALLET CHANGER DRIVES

Full range of sizes covering most applications, providing fast accurate motion and positioning with long trouble-free life.

ITALPLANT TOOL KNOCK-OUT UNIT

For applications where tools are retained by means of a stack of disc springs, ITALPLANT can supply a "knock-out" unit driven by a brake motor. This is particularly suitable for use in areas where the compressed air supply might be unreliable thus effecting pneumatic release of the springs.

ITALPLANT DISTRIBUTORS IN THE WORLD – DISTRIBUTORI *ITALPLANT NEL MONDO*
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GLOBOIDALCAM INDEXING UNITS HIGH SPEED 1000 RPM
TESTE A DIVIDERE A CAMMA GLOBOIDALE
AD ALTA VELOCITA' 1000 C/1'

ADJUSTABLE TRANSMISSION TORQUE (ATT) WITH SAFETY OUTPUT TORQUE LIMITER (SOTL)
INTERMITTORI CON REGOLAZIONE DELLA COPPIA TRASMESSA E LIMITATORE DI COPPIA DI SICUREZZA IN USCITA

PRECISION LINK CARRIERS
TRASPORTATORI A PASSO DI PRECISIONE

HIGH SPEED TOROIDAL INDEXERS
TESTE A DIVIDERE TOROIDALI AD ALTA VELOCITA'

PLEASE CONTACT OUR TECHNICAL OFFICE FOR FURTHER INFORMATION
CONTATTA IL NOSTRO UFFICIO TECNICO PER ULTERIORI INFORMAZIONI

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