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Department of consumer and corporate affairs / Ministère de la consommation et des corporations

STANDARDS BRANCH - DIRECTION DES NORMES

NOTICE OF APPROVAL E-74

OTTAWA July 3, 1969

LANDIS & GYR DIGITAL CODERS

TYPES

FCA 2.6n....,	FCA 3.6n....	non-resetting 6-digit register coders
FCA 2.7t....,	FCA 3.7t....	non-resetting 7-digit time-date coders
FCB 2.4n....,	FCB 3.4n....	resetting 4-digit demand coder, with or without cummulative register "e"

All above types are adaptable for use with any of the three types of code:

Telex International

Binary $\binom{5}{2}$

BCD 1-2-4-8-P

The code used depends entirely on the code drums with which the coders are fitted.

RATING AND INFORMATIVE DATA

Maximum impulse rate	5 pulses per second
Type of input	Single contact voltage pulse
Impulse voltage	Standard 115/120V A.C. Available on request 12,24,28,100, 110V A.C. or D.C.
Voltage of auxiliary motor	115/120V 60 Hz
Read-out contacts rating	200 mA 48V DC
Duration of encoding cycle	1.5 seconds (approximately at nominal auxiliary voltage)
Impulse memory capacity	9 pulses

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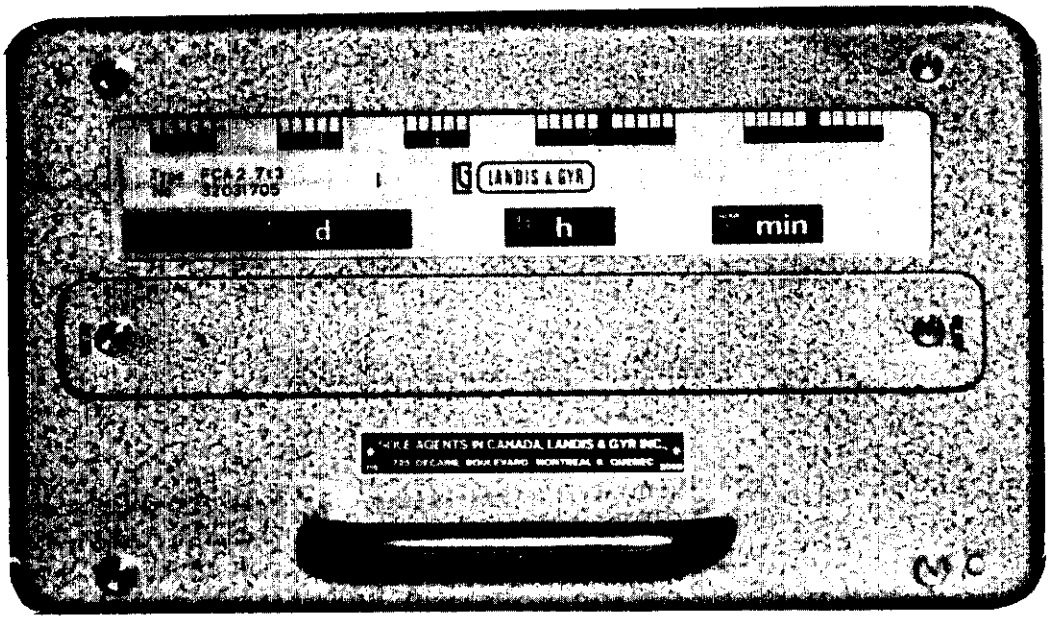
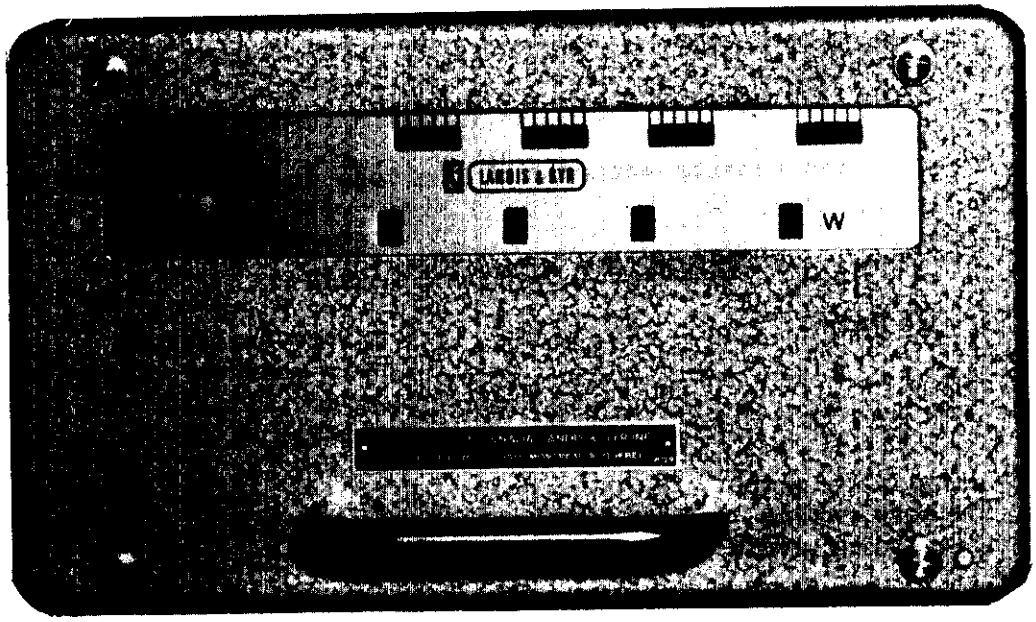


TIME DATE CODER



DEMAND CODER

Consumption of impulse stepping motor	2 watts maximum
Consumption of auxiliary motor	7 VA

NOTE: The time date coder FCA 2.7t is supplied with a time impulse relay instead of the stepping motor.

Type Designation is made up of the following letter number groups:

"FCA 2.6n3.."
123 4 56789

1 & 2	family	FC	applies to all series of coders covered by this approval circular
3	kind	A	non-resetting, meter register coder
		B	with zero reset, demand coder
4	output pattern of read-out	2	serializing of one decade to the next must be done by tape puncher
		3#	5 bit-lines per decade representing complete parallel code
5	digits	4*	4-digit coder (B kind)
		6	6-digit coder) A kind
		7	7-digit coder)
6	purpose	n	numeric counting
		t	time-date indicator
7	code used	1	Telex International 5-4-3-2-1 track values
		2	Binary $\binom{5}{2}$ 0-1-2-4-7 track values
		3	BCD 1-2-4-8-P track values
8 & 9	special features e.g.	e	cumulative (totalizing) register on "B" (demand) coders

This type of output cannot be used wih a tape puncher without an external unit (Diode Matrix) paralleling the equivalent bit-lines of all decades.

* The 4-digit (demand coders) may have decadic multipliers, as may be required with primary rated coders.

Since a maximum of 4 unoccupied terminals are available on the "B" coders, a maximum multiplier of 10^4 can be obtained.

When the multiplier is applicable the digit position (5) takes the form "a/b"-

with "a" being the number of actual digits which is always "4"
and "b" being the number of apparent digits, that is "5" "6", "7", or "8"

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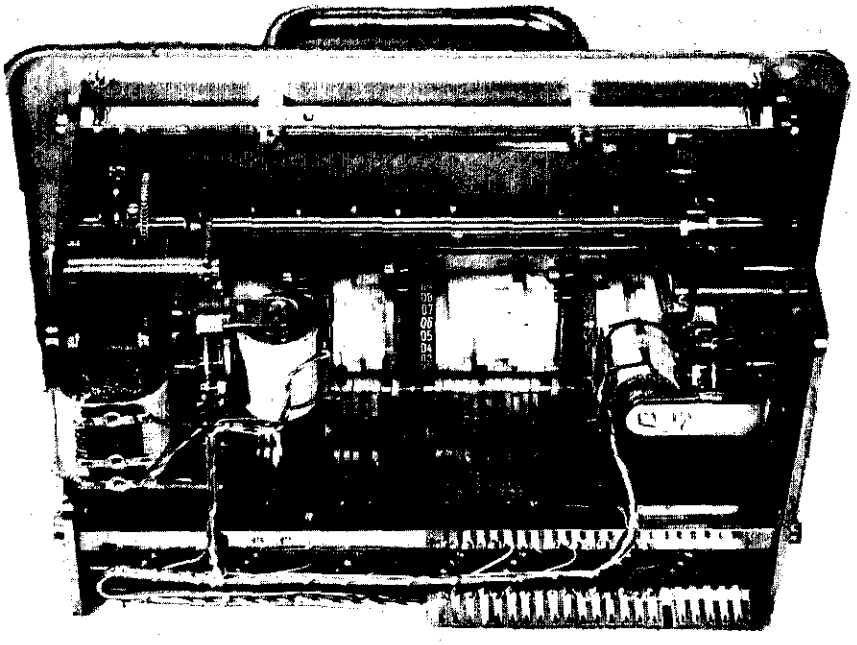

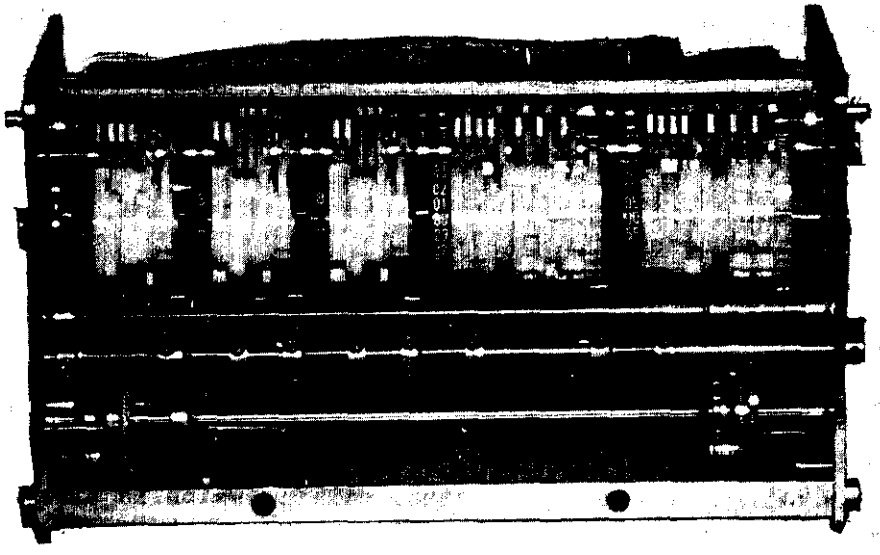

Example: FCB 2.4/6n3 - Demand coder for BCD code, with four digits and multiplier of up to 100 = ($10^6/10^4$) The actual multiplier is shown on the dial face of the coder.

DESCRIPTION

The type "FC--" Landis & Gyr Digital Coders are impulse operated telecounting instruments and serve to register and store meter readings or the average power demand during a predetermined time interval.

They are not self-contained metering devices and require to be connected to a primary measuring meter equipped with a 2-wire pulse transmitter.

The coder provides a link between the primary meter and the tape puncher type "NDB" or serves as a receiver in a telemetering application.

At a predetermined time on a signal from a separate time switch in conjunction with the tape recorder the transfer (encoding) cycle takes place, that is, the register reading of the coder is converted into a relative contact combination facilitating electrical selection (interrogation) by the tape puncher.

The accumulated register figure read-out is also transferred into the code position indicators - zeroing the code drums of the plain figure read-out for the count in progress.

This information - the contact switches combination and the finger-type indicators - remain all set according to the code on the code drums, even during a power intermission until the next sensing operation takes place.

The encoding takes approximately 1.5 seconds and is determined by 5 cams for each digit of the coder of five tracks of notches corresponding to the code used.

There is an additional numerical track for visual indication of the coded digit or the count in progress.

Any impulses arriving during encoding are stored in the torsion spring-type storage device capable of holding at least 9 pulses.

After completion of the cycle the register is fed with the impulses temporarily held in storage.

The plain figure register read-out corresponds to the count in progress, but the code position indicators show the stored - last encoded - value and each digital display, bit-lines 1 to 5 have the corresponding numerical values, which must be read from right to left.

The tape puncher "NDB" punches five tracks of holes in a paper tape which correspond exactly to the code position indicators of type "FC-" digital coders.

It is characteristic of BCD code that the number of indicators (yellow-fingers) for each digit or number of corresponding holes punched would always be an odd number.

When an actual count comes to an even number the parity indicator (last from the right) would appear for this purpose only and has no bearing at all on the digital reading.

However, when the parity indicator appears on its own it stands for zero in the series of a register number.

The digital coders are divided into two basic groups:

TYPE "FCA -" Meter Register Coders, which have 6 or 7 digit non-resetting cumulative registers and are used in the energy or time-date measurements

TYPE "FCB-" Demand Coder, has a 4-digit register with zero reset and serves for average values metering during a predetermined time interval - controlled from a separate time switch.

MAIN COMPONENTS AND THEIR FUNCTION

The pulses from the primary meter energize a stepping motor which makes one full revolution for each pulse.

The stepping motor through a storage spring, exchangeable variable ratio gears and an escapement, drives a set of code drums.

The variable ratio gears in conjunction with the code drums with multiple unit jumps of 1, 2, 3, 4 or 5 units per impulse makes primary or secondary readings possible.

On a signal from a separate timing switch, and in conjunction with the tape puncher, the encoding cycle is initiated by energizing the sensing solenoid which through a mechanical arrangement releases the brake of the auxiliary motor which is always under power and as it turns performs the encoding of the code drums, that is, the register reading of the coder is converted into a relative contact combination. The sensing cam levers are fitted with output contacts which complete the electrical circuit for the electro-magnetic tape puncher. After encoding has been completed, the resetting and zeroing of the code drums takes place and on completion application of the brake brings the motor to standstill.

The zeroing of the code drums is not applicable to the cumulative (meter register) coders, where encoding takes place without a reset operation.

The instrument is enclosed in a rectangular sheet-metal case with a plug-in type counector at the rear, and a glass window in front through which the register and code position indicators are visible.

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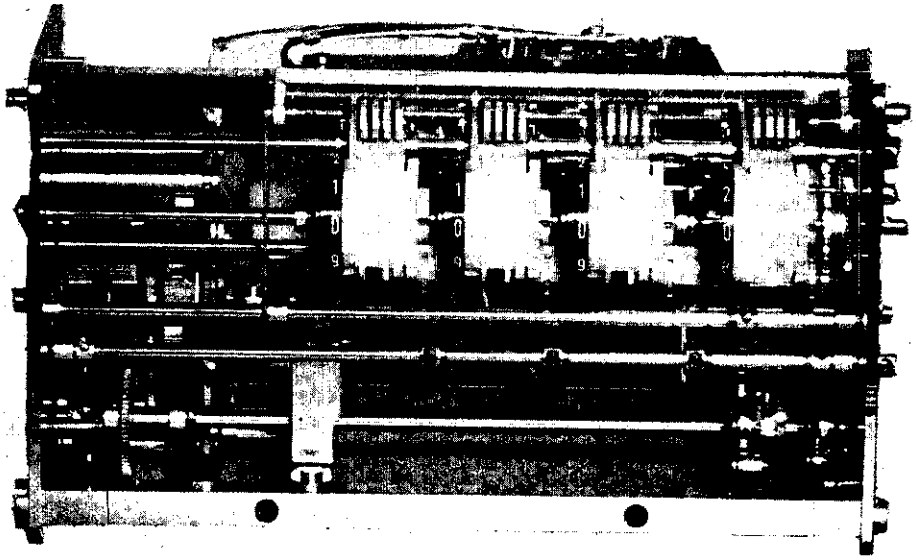

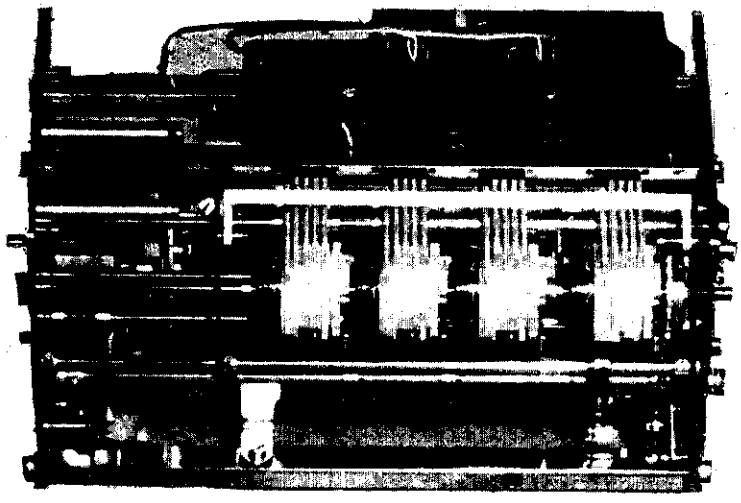

The front cover and the connector adaptor are held by the wire sealable cross-drilled fillister head screws.

The protruding ends of the printed circuit boards (male connectors) are provided with a notch, into which fits a rider in the plug (female connector), to prevent accidental wiring of e.g. the time-date coder to a numerical coder position.

TIME DATE CODER

The Digital, Date-Hour and Minute Coder is a modified version of the cumulative non-resetting coder, but is equipped with a special register which is operated by time impulses arriving at the rate of one every five minutes.

It possesses two double code drums, one counts minutes from 00 to 55 in steps of 5 minutes each and the other hours from 00 to 23.

The next three standard code drums, for the day count have numerals from 000 to 999 and then reset automatically to 000.

The code drums are directly driven by a rotary solenoid (FCA2.7t...) or by a stepping motor (FCA3.7t...) actuated by the 5-minute clock impulses and the register gives the following day and the actual time in steps of 5 minutes from the first day of the year.

The code position indicators however show the time of the last encoding that took place.

It should be noted that the resetting of the time-date coder at the end of the year is not automatic because the day drums are standard with the numerals from 0 to 9, count 400 e.g. would therefore mean "day 35" of the new year, following a normal (365-day) year.

The removable plate just below the register provides an access to the drums for the manual time resetting.

The coders are intended primarily for use with tape puncher type "NDB--" but may be used also with any approved suitable metering or auxiliary devices.

In verifying these instruments or installations incorporating them it will be necessary to check that the kilowatthours, kilowatts or time per impulse are given and that all multipliers when applicable are accounted for.

The actual accuracy test should verify complete agreement between the transmitted pulse value, or relative advance of the primary meter register, and the coders plain figure read-out.

.....10/

Then comes verification of the current count transfer into code position indicators which value in turn is punched on a paper tape by the tape puncher or retransmitted by means of a telemetering installation.

Approval granted to:

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